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Supplemental Annotated BIBLIOGRAPHIES

OF THE

BLACK CUTWORM, GLASSY CUTWORM, BRONZED CUTWORM, BRISTLY CUTWORM, DINGY CUTWORM, DARK-SIDED CUTWORM, CLAY-BACKED CUTWORM, DUSKY CUTWORM, AND VARIEGATED CUTWORM

Supplement II

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SUPPLEMENT II

Roy W. Rings[1], Fred J. Arnold[2], and Beth A. Johnson[2]

Introduction

The purpose of this circular is to update the bibliographies on the black cutworm, *Agrotis ipsilon* (Hufnagel); the glassy cutworm, *Crymodes devastator* (Brace); the bronzed cutworm, *Nephelodes minians* Guenée; the bristly cutworm, *Lacinipolia renigera* (Stephens); the dingy cutworm, *Feltia ducens* Walker, *Feltia subgothica* (Haworth) complex; the dark-sided cutworm, *Euxoa messoria* (Harris); the clay-backed cutworm, *Agrotis gladiaria* (Morrison); the dusky cutworm, *Agrotis venerabilis* (Walker); and the variegated cutworm, *Peridroma saucia* (Hübner). These bibliographies were recently published as research circulars of the Ohio Agricultural Research and Development Center and are listed under the senior author's name in this publication. Since many publications were unavailable in Ohio, these were requested from national libraries, a process requiring considerable time. After receiving reprints and photocopies of pertinent articles, many of these had to be translated into English for the preparation of the annotations. For these reasons, many citations were not included in the original publications and therefore appear in this second supplement.

These publications are not intended to be comprehensive from the standpoint of checklists, faunal lists, texts, and comprehensive publications, but are intended to summarize the information on biology, ecology, behavior, developmental biology, seasonal and geographical distribution, host range, natural enemies, economic importance and control, research techniques, and other information useful to insect pest management programs.

The following publications have been reviewed for citations in the originals and supplements, with the years covered in parentheses.

Zoological Record (1864-1969)

Bibliography of the More Important Contributions to American Economic Entomology (1889-1905)

Index to the Literature of American Economic Entomology (1905-1959)

Review of Applied Entomology (1913-1976)

Biological Abstracts (1926-1976)

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Bibliography of Agriculture (1942-1976)

U.S.D.A. Insect Pest Survey Bulletin (1921-1950)

U.S.D.A. Cooperative Economic Insect Report (1951-1976)

Canadian Agricultural Insect Pest Review (1923-1973)

This literature search recovered some, but not all, checklists, faunal lists, museum lists, and taxonomic papers which cannot be abstracted for the recovery of a single species.

The present supplement will be the last of the supplements to be published since the grant under which this work was done expired on July 31, 1977. This series of publications on subterranean cutworms consists of a total of 14 bibliographies. The circular numbers, subjects, and dates of issue are:

Research Circular 198, Black cutworm, June 1974
Research Circular 199, Glassy cutworm, Oct. 1974
Research Circular 200, Bronzed cutworm, Nov. 1974
Research Circular 201, Bristly cutworm, May 1975
Research Circular 202, Dingy cutworm, Sept. 1975
Research Circular 205, Dark-sided cutworm, Dec. 1975
Research Circular 212, Supplement I, Feb. 1976
Research Circular 215, Sandhill cutworm, Feb. 1976
Research Circular 216, Clay-backed cutworm, Feb. 1976
Research Circular 217, Dusky cutworm, March 1976
Research Circular 219, Variegated cutworm, June 1976
Research Circular 225, Yellow-headed cutworm, Nov. 1976
Research Circular 235, Spotted cutworm, Dec. 1977

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Thanks are also due to the very competent OARDC library staff consisting of Miss Virgie Sapp, Mrs. John Gregory, Mrs. Wilbur Winkler, and Miss Elizabeth Kinney for their invaluable assistance in locating references.

Bibliography

Entries are listed alphabetically by author except in cases where the publication is anonymous or more likely to be identified with a governmental agency under which it was published. The abbreviations in the citations follow the American standard for periodical title abbreviations published in Biological Abstracts, 45(13) 4347-4361. All references in this publication deal with the black cutworm, the glassy cutworm, the bronzed cutworm, the bristly cutworm, the dingy cutworm, the dark-sided cutworm, the clay-backed cutworm, the dusky cutworm, and the variegated cutworm. However, the scientific name used in a given article is also used in the annotation so that there is no question as to the species being cited. In cases where the name is much different from the name in current use, both are given. The number in parentheses following the annotation represents the page number which includes information on these cutworms if it is different from the citation page numbers.

I. Supplement to Black Cutworm Bibliography

Abbas, H. M. and A. Farid-ud-din. 1961. Insect pests of pulses in Pakistan. Agr. Pakistan 11(4):583-599.
Agrotis ypsilon is a major pest of young pulse plants in northern Pakistan. (595)

Abdel-Megeed, M. I., Z. H. Zidan, and R. A. Khalid. 1974. Response of the greasy cutworm, *Agrotis ypsilon* Rott., to certain antifeedants. Z. Angew. Entomol. 76(1):106-110.
Seven concentrations of the antifeedants Brestan, Brestanol, Duter, Duter terra, and Suzo were tested against *Agrotis ypsilon*. The higher the concentration, the higher was the percentage of starvation. Considering SC50 values, Brestan, the most active antifeedant, was about 1.8, 2.5, 8, and 18 times as much as Duter terra, Duter, Brestanol, and Suzo, respectively.

Abu Yaman, I. K. and S. J. Jarjes. 1968. Insects of vegetables in N. W. Iraq. Z. Angew. Entomol. 62(1):46-51.
Agrotis ypsilon was reported as a pest of turnip and radish in Mosul and Hammam-Alil. (48)

Alam, M. Z. 1962. A list of insects and mites of East Pakistan. East Pakistan Govern. Press, Dacca. 111 pp.
Agrotis ypsilon is listed as a pest of tobacco and vegetables at Dacca. (58)

Alam, M. Z., A. Ahmed, S. Alam, and M. A. Islam. 1965. A review of research, Division of Entomology (1947-1964). Dacca Agr. Inf. Serv. & E. Pakist. Agr. Res. Inst.:1-272.
Agrotis ypsilon was reported as a major pest of tobacco in East Pakistan. The larvae cut off the base of the stem in February and March. (12)

Allan, D. J. 1975. Greasy cutworm, *Agrotis ipsilon* Hufnagel, life cycle. Dep. Sci. Indust. Res. Info. Ser. 105/11. New Zealand. 3 pp.
The life stages, host plants, damage, distribution, and life cycle of the black cutworm are illustrated and described.

Allan, D. J. 1973. Rearing *Agrotis ypsilon* (Lepidoptera:Noctuidae) for parasite release. New Zealand Entomol. 5(3-4):274-277.
Black cutworms were reared in large numbers on dock and plantain leaves and on sliced carrots. One-hundred larvae per day were required to rear two braconid parasites from Pakistan. This procedure resulted in the release of 76,000 parasites.

Anonymous. 1965. A host list of the insects of Thailand. Bangkok, Ag. Int. Dev. U. S. Op. Miss. Thailand:1-149.
Agrotis ypsilon is listed as a pest of Brassica sp. (15)

Anonymous. 1975. Black cutworm damage to corn. Ill. Natur. Hist. Surv. Rep. 144:1-2.
Field studies indicate that for every 1% of corn plants damaged by cutworms during May and June, a yield loss of 0.7% will result.

Anonymous. 1975. The moths that went to sea. U. S. Dep. Agr., Agr. Res. 24(1): 12-13.

Black cutworm moths were caught in black light traps placed on unmanned oil drilling platforms in the Gulf of Mexico. The trap nearest to shore was 20 miles between Morgan City and Jeanerette, La. (12)

Appert, J. 1967. Notes techniques sur les insectes nuisibles aux cultures Malagasy. Agron. Trop. 22(2):153-230.
The black cutworm is discussed as a pest of young tobacco in Malagasy. Its geographical distribution and chemical control are treated. The braconid, *Meteorus brevicornis* Granger, is the most important parasite of *A. ipsilon* in this country. (158) (Translated from French.)

Archer, T. L. and G. J. Musick. 1976. Responses of black cutworm larvae to light at several intensities. Ann. Entomol. Soc. Amer. 69(3):476-478.
"The behavioral response of black cutworm, *Agrotis ipsilon*, larvae to several light intensities was determined. The first two instars tended to be slightly photopositive. The third instar demonstrated the first photonegative behavior. The fourth to sixth instars were photonegative and the degree of negativity was positively correlated with instar age."

Archer, T. L. and G. J. Musick. 1977. Evaluation of sampling methods for black cutworm larvae in field corn. J. Econ. Entomol. 70(4):447-449.
"Apple pomace-bran pelleted baits and pitfalls were evaluated as sampling tools for larvae of *Agrotis ipsilon* (Hufnagel) in field corn. Optimal bait placement was between alternating corn rows. A 3-day sampling period provided the most reliable estimate of population density. The percent capture for two baits, four baits, two pitfalls, and four pitfalls was 10.7, 15.7, 7.6, and 13.5, respectively, for the 3-day sampling period. Significantly more larvae were recovered when using four traps than when using two traps."

Artigas, J. N. 1972. Population dynamics in Lepidoptera of agricultural importance in Chile. Bol. Soc. Biol. Concepcion 45:5-93.
Host plants, characteristics of larval damage to crops, life history, description of larva and adult, numerical seasonal variations of the adult population, and percentage of each sex for *Feltia subterranea* are discussed.

Azuma, S. 1965. Heterocera from the Yonaguni Island, Southern Ryukyus. Biol. Mag. Okinawa 2(4):52-57.
"13. *Agrotis ipsilon* Hufnagel. Sonai, 1 male 24. V. 1965. This species is new to the fauna of Yonaguni Is., but in my collection there are many specimens collected from Okinawa Is., Ishigaki Is., Miyako Is., and Minami-daito Is." (53)

Bertoloni, A. di 1874. Al danno arrecato alla canapa, al formentone ec. dall' *Agrotis suffusa* Ochsm. var. *pepoli* Bertol. Nep. Boll. 6:139-146. Soc. Entomol. Ital., Florence.
The larva, pupa, and imago of *Agrotis suffusa* Ochsm. (=*Agrotis ipsilon*) variety *pepoli*, are figured and described in detail. Male and female differences are described and an ichneumonid parasite is discussed as a natural enemy of the larvae. (Translated from Italian.)

Best, R. L. and C. C. Beegle. 1977. Consumption of *Agrotis ipsilon* by several species of carabids found in Iowa. Environ. Entomol. 6(4):532-534.
"As part of an evaluation into their effectiveness as natural control agents, seven species of carabids (*Scarites substriatus* Haldeman, *Evarthrus alternans* Casey, *Pterostichus chalcites* Say, *P. lucublandus* Say, *Bembidion quadrimaculatum* L., *B. rapidum* Leconte, and *Harpalus pensylvanicus* DeGeer) commonly found in Iowa cropland, were tested to quantify their prey consumption. Tests were

conducted under laboratory conditions with various stages of black cutworm used as prey. The experiment was divided into two main parts: maximum consumption during 24 hours and continued prey consumption per day over a 4-day period. Results of the 24-hour feeding trials revealed that all species tested are capable of consuming large amounts of prey. With the exception of *E. alternans*, results of the continued feeding trial indicated that a carabid population is capable of consuming both a relatively high and constant amount of prey over an extended period of time."

Biezanko, C. M., R. E. Bertholdi, and O. Baucke. 1949. Relacão dos principais insetos prejudiciais observados nos arredores de Pelotas nas plantas cultivadoas e selvagens. Agros 2(3):156-213.
Agrotis ypsilon Rott. is listed as a pest of oats (*Avena sativa* L.), Italian ryegrass (*Lolium multiflorum* Lamk.), tobacco (*Nicotiana tabacum* L.), and wheat (*Triticum aestivum* L.).

Biezanko, C. M. and A. Ruffinelli. 1971. Fauna de Lepidoptera del Uruguay. X. Agaristidae, Noctuidae et Thyratidae. Cent. Invest. Sanidad Vegetal (Montivideo-Uruguay) Agr. Zool. Ser., Tech. Pub. 2:1-31.
Agrotis ipsilon Hufnagel moths were captured in January, April, November, and December at Montivideo. The host range includes beet, *Helianthus*, cabbage, corn, tomato, pimento, tobacco, potato, and lettuce. (12-13)

Blair, B. W. 1975. Behavioral studies on the larvae of *Agrotis segetum* (Dennis and Schiffermüller) and *A. ipsilon* Hufnagel (Lepidoptera:Noctuidae): Towards better pest management. Proc. Cong. Entomol. Soc. So. Afr. 1:19-33.
The phototactic responses of different instars of *Agrotis segetum* and *A. ipsilon* were recorded. In both species larvae were photopositive in the first two instars but became photonegative in the later part of the third instar. The feeding behavior of these species was studied on tobacco, crop debris, and weeds.

Blair, B. W. 1976. A new look at cutworm control. Rhodesian Agr. 70(6):163-164.
The response to light, feeding behavior, and survival on crop debris is discussed for the cutworms, *Agrotis ipsilon* and *A. segetum*. Scouting for first to third instar larvae is suggested as a new approach which permits the application of contact insecticides before much cutworm damage is done.

Boisduval, J. A. 1840. Genera et index methodicus Europaeorum Lepidopterorum. Parishs, Apud. Roret, Bibliopolam. p. 109.
"822 *Suffusa*, F., H., G., Tr., B... Gall. bor., etc. Julii Augusti." *Suffusa* is a synonym of *Agrotis ipsilon* (Hufnagel). Gall. bor. is translated as France, boreal.

Breniere, J. 1959. Service de recherches appliquees a la protection des vegetaux. Bull. Inst. Rech. Agron. de Madagascar, 3:1-140.
This article contains a discussion of *Agrotis ypsilon* as a tobacco pest in Madagascar. The life stages are described and illustrated. (131-132) A key to the insect and plant disease pests of field and stored tobacco is presented. (106) (Translated from French.)

Broersma, D. B., J. R. Barrett, Jr., and J. O. Sillings. 1976. Activity and blacklight induced flight of black cutworm and European corn borer as related to temperature and relative humidity. Environ. Entomol. 5(6):1191.
Flight behavior and response to blacklight of black cutworm (BC), *Agrotis ipsilon* (Hufnagel), and European corn borer (ECB), *Ostrinia nubilalis* (Hübner), adults were determined in laboratory tests at temperatures ranging from 0-55° C.

ECB was tested at two air moisture conditions, less than 30% RH and 30-60% RH, while BC was only tested at one condition, between 30-60% RH. BC moths were active at lower temperatures (3° C) than were ECB (15° C). Both species were above 90% active from the lower temperature limits up to 45° C. Male BC moths were slightly less responsive than females to blacklight. Male and female ECB moths responded similarly except at low temperatures. The peak for ECB flight response occurred at higher temperatures in conditions of low relative humidity than in conditions of moderate humidity.

Busching, M. K. and F. T. Turpin. 1976. Oviposition preferences of black cutworm moths among various crop plants, weeds, and plant debris. J. Econ. Entomol. 69(5):587-590.
Fourteen crop and weed species plus plant debris were tested for oviposition preferences to laboratory-reared black cutworm moths. Curled dock and yellow rocket mustard were found to be most attractive. Corn and soybeans were among the least attractive of the plants tested.

Busching, M. K. and F. T. Turpin. 1977. Survival and development of black cutworm (*Agrotis ipsilon*) larvae on various species of crop plants and weeds. Environ. Entomol. 6(1):63-65.
Larval development, pupation, and adult emergence of black cutworms were investigated using 16 possible larval food sources. Food sources included crop plants, weeds, and field debris. Larval survival was highest on bluegrass, curled dock, and wheat, while no larval survival occurred on giant foxtail or debris.

1974. Can. Insect Pest Rev. 52:7, 10, 17.
On tobacco in Kentville, Nova Scotia, cutworm infestations were low. Black cutworms were second to dark-sided cutworms in abundance. (7) Black cutworm populations increased in Kentville, Nova Scotia. (10) In Ontario "black cutworm caused considerable damage to seedling corn in the Prince Edward County region. Control was difficult due to the difficulty of reaching the underground caterpillars with an insecticide." (17)

Capco, S. R. 1957. A list of plant pests of the Philippines with special reference to field crops, fruit trees, and vegetables. Philippine J. Agr. 22(1-4):3-80.
Agrotis ypsilon is reported to attack rice (leaves), sugar cane (leaves), tobacco (leaves), coffee (shoots and leaves), Irish potato (stems and leaves), vegetables (cabbage, cauliflower, mustard, pechay, radish, and lettuce), okra, and roselle. (9,17,24,26,31,62,66)

Carvalho, S., M. Fernando, S. Tarrago, and D. Link. 1971. Captura de noctuideos atraves de armadilha luminosa. I - Resultados preliminares. Rev. Cent. Ciencias Rurais 1(3):15-22.
"This work was made to determine the noctuid occurrence at Santa Maria, RS, with a light trap. Forty-one species of noctuid adults were collected. This number corresponds to 38.2% of the moths trapped. The worms of nine noctuid species trapped are known to feed on the rice plant." Four moths of *Agrotis ipsilon* were trapped from March to July, 1971, at Santa Maria.

Cheo, Ming-Tsang. 1936. A preliminary list of the insects and arachnids injurious to economic plants in China. Peking Nat. Hist. Bull. 10(4):291-308.
In China the crops attacked include cotton, soybeans, potatoes, buckwheat, eggplant, sugar beets, onions, carrots, cabbage, radish, peas, tobacco, corn,

Chinese cabbage, tea, broccoli, raab, *Brassica rapa*, cauliflower, cucumber, and Kaoliang. The geographical distribution in China is given. (299)

Chiang, H. C. 1978. Pest management in corn. Ann. Rev. Entomol. 23:101-23.
This article briefly describes the multi-state project on bionomics and management of soil arthropod pests. Some research results include the preparation of keys for identifying armyworms and cutworms, baiting and trapping methods for the black cutworm, responses of the black cutworm to sex pheromones and the identification of the pheromone, and failures and successes in controlling cutworms.

Cramer, P. 1859. Papillons exotique des trois parties du monde Re: *Phalaena* (*Bombyx*) *idonea*. Pap. Exot. 4:43.
Agrotis idonea (=*A. ipsilon*) moth description of specimens collected in Surinam.

d'Araujo e Silva, A. G., d'A. Goncalves, D. M. Galvâo, A. J. L. Goncalves, J. Gomes, M. D. N. Silva, and L. de Simoni. 1968. Quarto catálogo dos insetos que vivem nas plantas do Brazil, seus parasitos e predadores. Parte II- 1° Tomo. Insetos, Hospedeiros e Inimigos Naturais. Min. Agr., Dep. Defesa. Inspec. Agropec. Lab. Cent. de Patolog. Vegetal., Rio de Janiero.
In Brazil *Agrotis ypsilon* (Rott.) attacked oats, rye, wheat, rice, ryegrass, grass, beets, broccoli, cabbage, beans, cauliflower, kale, kohlrabi, honeydew melon, onion, Irish potato, tomato, watermelon, peanut, tobacco, strawberry, carnation, and pinks. (228-229)

de Joannis, J. 1928. Lépidoptères hétérocères du Tonkin. Ann. Soc. Entomol. France 97:241-368.
Agrotis ypsilon (Rott.) was recorded from Hanoi (North Viet Nam) near the Tonkin Gulf. Synonyms mentioned are *Phalaena ypsilon* Rott. and *Noctua suffusa* Fab. (289)

Dodge, B. O. and H. W. Rickett. 1943. Diseases and pests of ornamental plants. Jaques Cattell Press, Lancaster, Pa. 638 pp.
"Cutworms are the larvae of moths such as *Lycophotia saucia* and *Agrotis ypsilon*."

Draudt, M. 1924. *Agrotis*. (*In*) Seitz, A. Die Gross-schmetterlinge der Erde 7:56.
"*A. ypsilon* Rott. (=*suffusa* Schiff., *telifera* Harr.) (9d) is the well-known species being also distributed in the palearctic and Indo-Australian regions. In America its range extends from Canada through Mexico and Central America, Brazil, and Peru to Chile and Argentina."

Eckenrode, C. S., P. S. Robbins, and D. R. Webb. 1976. Control of seedcorn maggot, cabbage maggot, and black cutworm (1975 insecticide research report). N. Y. Food Life Sci. Bull., Plant Sci. 63:1-5.
The synthetic pyrethroids FMC 33297 and SD 43775 were effective against black cutworms (BC) in the greenhouse test even after 5 days. In the field, the FMC compound was effective. The more effective SD material in the greenhouse test was not applied in the field trial. The conventional insecticides were inadequate or only moderately effective. Certain of the synthetic pyrethroids clearly show promise in control of the BC.

Eichler, W. 1951. Eulenraupen als Rübenschädlinge. Nachrichtenbl. Deut. Pflanzenschutz. dienst, n. ser. 5(6):115-119.

"The black cutworm is not nearly as destructive in Europe as it is in warmer countries, where it has two generations. The cutworms are found in July on grass roots. They are destructive to different cultivated plants such as tobacco, cotton, sorghum, potatoes, corn, onions, poppies, rape, turnips, cranberries, beans, and garbanzos."

El-Kifl, A. H., E. A. Nasr, M. M. Ibrahim, and G. M. Moawad. 1972. Effect of host plants on various stages of *Agrotis ipsilon* (Hufn.) (Lepidoptera: Noctuidae). Bull. Soc. Entomol. Egypt 56:103-111.
Agrotis ipsilon larvae were reared on cotton, corn, castor bean, alfalfa, clover, and sweet potato. Effects of diet are related to larval period, pupal weight, pupal period, adult longevity, reproductive potential, preoviposition, and oviposition periods.

El-Kifl, A. H., A. L. Abdel-Salam, and N. Farid. 1974. Development and histology of the scent glands in the female moth, *Agrotis ipsilon* Hufn. Bull. Soc. Entomol. Egypt 58:323-330.
Serial longitudinal, transverse, or oblique sections were made in the terminal abdominal segments of pupae of 1,2,3,4,5, and 6 days old and just before emergence from the pupa. Sections of moths were made just after emergence and after 1,2,3, and 4 days. Sections were also made after mating and oviposition. The best methods of fixing and staining are referred to. The sites, histological structure, and development of the scent glands were assessed.

Elsayed, E. I. 1975. Effect of different host plants on larval development and on response of black cutworm *Agrotis ipsilon* (Hufnagel) to Sevin. Z. Angew. Entomol. 79(4):365-369.
"Effects of feeding different host plants on the development of *Agrotis ipsilon* larvae, and on their response to sevin are described. The plants used were lettuce, alfalfa, spinach, castor, and cabbage. These food plants caused marked effect on larval growth and larval growth period. Variations on the LC_{50} values ranged between 1 and 10 times, as a result of feeding the larvae on these plants after they were treated with sevin." (365)

Fabricius, J. C. 1787. Mantisa insectorum II:157.
Noctua suffusa (=*Agrotis ipsilon*) is described in Latin. The habitat is briefly discussed.

Fernando, M., S. Tarrago, S. Carvalho, and D. Link. 1975. Survey of the family Noctuidae, with light traps, in Santa Maria, RS. Rev. Cent. Ciencias Rurais 5(2):125-130.
The present work reports on a survey of the family Noctuidae in the region of Santa Maria, RS, with the "Luiz de Queiroz" light traps over a 2-year period with four collections per week. Species were catalogued on a monthly basis. Diversity index was calculated for the duration of the collections. *Agrotis ipsilon* was trapped every month of the year except July.

Figueroa, G. E. S. and E. P. do Prado. 1973. *Agrotis ypsilon* and its control. Cacao, bananas, pests. Cacau Atualid-ades. 10(1):7-8.
The black cutworm is reported as a pest of cacao and bananas. In control experiments, Carvin (=Sevin) gave 100% control in 72 hours whereas malathion gave only 40% and BHC 16%. (8)

Flaschenträger, B. 1949. Über anlockungsstoffe von baumallschädlingen. Angew. Chem. 61:252.

The author reported that the female *Prodenia litura* begins to secrete a chemical attractive to males within an hour after emerging from the pupa. The attractant of female *P. litura* triggered a response by male *Agrotis ipsilon* Hufnagel.

French, J. A., C. C. Beegle, S. A. Myers, G. E. Wilde, and P. VanDerSchaaf. 1978. Black cutworm control in corn with Lorsban insecticides. Dow Chem. Co., Midland, Mich., Down to Earth 34(2):1-6.
This article summarizes 1977 field tests conducted in Illinois, Kansas, Iowa, and Missouri with Lorsban 4E, Sevin 80W, Dylox 80WP, Nudrin 1-8E, Penncamp 2E, toxaphene, and CGA 12223 4E. Control of black cutworms with Lorsban was excellent in the four test sites where there were wide ranges in larval size, environmental conditions, and test methods.

Grote, A. R. 1864. List of a collection of Lepidoptera Heterocera, taken near Williamstown, Mass. Proc. Entomol. Soc. Phil. 3:92-96.
Agrotis suffusa and *A. telifera* are included in this list. (95)

Grote, A. R. 1875. Checklist of the Noctuidae of America, North of Mexico. Beinecke & Zesch., Printers, Buffalo, N. Y. (1):1-28.
The black cutworm is included in this list as *Agrotis ipsilon* (Rott.). *Noctua suffusa* and *Agrotis telifera* Harr. were considered synonyms. (7)

Grote, A. R. 1882. New checklist of North American moths. New York Entomol. Club. 73 pp.
The black cutworm is included in this checklist as *Agrotis ypsilon* Rott. Synonyms listed are *suffusa* s.v., *telifera* Harris, and variety *idonea* Cramer. (25)

Grote, A. R. 1890. Revised checklist of the North American Noctuidae. Part I. Thyatirinae-Noctuinae. Homeyer and Meyer, Bremen. p. 10.
This checklist includes *ypsilon* Rott. as number 295 and lists as synonyms *suffusa* Schiff., *telifera* Harr., and a variety *idonea* Cram.

Guagliumi, P. 1967. Insects and arachnids of the common plants of Venezuela reported in the period 1938-63. Relaz. Monogr. Agrario-Subtrop. Trop. (N.S.) 86:1-391. (Rev. Appl. Entomol, 56:452).
Agrotis ypsilon (Hfn.), *Agrotis repleta* Wlk., and *Feltia subterranea* (F.) were reported as pests of tobacco in Venezuela. (137) (Translated from Spanish.)

Hampson, G. F. 1894. The fauna of British India including Ceylon and Burma. Moths. Vol. 2. Taylor and Francis Pub. Co., London, England. 204 pp.
Noctua suffusa Fabr., *Phalaena idonea* Cram., *Bombyx spinula* Esp. are listed as synonyms for *Agrotis ypsilon* Rott. The difference between *A. ypsilon* and *A. segetum* is discussed. *A. ypsilon* is universally distributed except in South America. (Hampson in error. *A. ipsilon* does occur in South America--author.)

Hassanein, M. H., F. M. Khalil, and A. A. El-Naby. 1971. Abundance and population density of three lepidopterous insects in Upper Egypt (Lepidoptera: Noctuidae). Bull. Entomol. Soc. Egypt 60:79.
"The greasy cutworm, *Agrotis ipsilon* Rott., seems to have two peaks annually; the first one occurs about the end of April and the second one is observed about the end of September. Number of moths caught in the first peak was comparatively very high with those of the second peak. Sex ratio indicated a percentage of male moths much higher than that of female moths."

Hassanein, M. H. 1972. Abundance and population density of three lepidopterous insects in Upper Egypt (Lepidoptera: Noctuidae). 55:79-83.
Seasonal distribution studies at Assiut, Egypt, showed two annual peaks in the flight of *Agrotis ipsilon*. The first peak occurred in 1965 on April 27 while the second was recorded at the end of September. (80)

Haworth, A. H. 1803. Lepidoptera Brittannica; Sistens Digestionem Noram Insectorum Lepidopterorum que in Magna Brittania Reperiuntur. 1-609.
The "dark sword-grass" is described in Latin as *Noctua suffusa* (=*A. ipsilon*).

Helson, G. A. H. 1952. Insect pests affecting horticultural crops and plants in New Zealand. Dep. Agr. New Zealand Hort. Div. Circ. 2:24.
Agrotis ypsilon is recorded attacking tomato, brassicas, corn, grasses, cape gooseberry, bean, tobacco, and clover. (24)

Herbulot, C. and P. Viette. 1951. Lépidopteres récoltés par MM. A. Reymond et F. Pierre dans la région de Beni-Abbès (Sahara Algérien). Rev. Franc. Lépidop. 13(5-6):89-96.
One male *Agrotis ypsilon* (Rott.) was collected on March 21, 1948, at Beni-Abbes in east-central Algeria. (93) (Translated from French.)

Hübner, J. 1805. Sammlung Europaischer Schmetterlinge. 4:28.
Agrotis suffusa is illustrated.

Hudon, M. and P. Martel. 1973. Insects of market cultures in southwestern Quebec in 1972. Ann. Soc. Entomol. Que. 18(1):3-4.
The principal species of cutworms attacking truck crops in southwest Quebec were *Agrotis ipsilon* (Hufn.), *Euxoa ochrogaster* (Guen.), *Amathes c-nigrum* (L.), *Euxoa tesellata* (Harr.), *Nephelodes minians* Guen., and *Euxoa messoria* (Harr.).

Jacobson, M. 1965. Insect sex attractants. Interscience Publishers, N. Y. 154 pp.
"With the aid of a simple apparatus it was determined that female *Agrotis ypsilon* at least 1 hour old produce an attractant for the males in their last two abdominal segments. The excised segments lose their attractiveness when placed in a vacuum, but they again become attractive within 15 minutes (or 2 hours) after removal from the vacuum. The activity disappears completely from the cut segments after 1-1/2 to 3 hours. The attractant may be collected from the abdominal segments with a stream of air ("freezing-out"), steam distillation, or extraction with various solvents, especially ether." (6)

Jacobson, M. 1972. Insect sex pheromones. Academic Press, N. Y. 382 pp.
The references to *Agrotis ypsilon* are identical to those in Jacobson, M. 1965.

Janes, M. J. and W. G. Genung. 1975. Insecticide evaluation for control of leafminers and beet armyworms on celery, leafminers and cutworms on lettuce. Belle Glade AREC Res. Rep. EV-1975-1:1-6.
Monocrotophos 0.5 lb, dimethoate 0.5 lb, methomyl 0.45 lb + oxamyl 0.45 lb, and methanidophos 0.5 lb were the more effective compounds for the control of armyworms and cutworms *Agrotis ipsilon* (Hufnagel) and *Feltia subterranea* (Fabricius). (2)

Johnston, A. 1959. Common diseases and pests of crops in Malaya with suggestions for their control. Malaya Dep. Agr. Bull. 110:17.
Agrotis ypsilon is listed as a pest of cabbage. Aldrin and poison baits using Paris green or gamma BHC are recommended for control.

LePelley, R. H. 1959. Agricultural insects of East Africa. East Africa High Comm. Nairobi, Kenya. 307 pp.
Agrotis ypsilon Hufnagel was reported as a pest of corn in East Africa. (67)

Lever, R. J. A. W. 1946. Insect pests in Fiji. Bull. Dep. Agr. Fiji 23:1-36.
Agrotis ypsilon is noted as a pest of potato (8) and tobacco (14) in Fiji.

Lincoln, C. and D. Isely. 1945. Armyworms and cutworms, Univ. Ark., Coll. Agr. Ext. Serv. Circ. 436:1-10.
Overflow worms (*Agrotis ipsilon*) are a problem on land which has been flooded. Thorough disking following an overflow and then keeping the land clean for 2 weeks before planting is suggested to prevent damage. (7-8)

Link, D. and G. Knies. 1973. Aspectos bionômics sobre as lagartas-roscas que ocorrem em Santa Maria, RS. Ann. Soc. Entomol. Brasil 2(1):66-73.
During 1971 and 1972 cutworm collections were periodically made and annotated for host, pupal date, imago, sex, species, when parasitized, and their natural enemies. The black cutworm, *Agrotis ipsilon,* was the predominant species, and the months of August and September were the periods of major incidence. (66)

Lintner, J. A. 1888. Cut-worms. N. Y. State Mus. Bull. 6:1-36.
Appearance, habits, natural history, favorable conditions, food plants, literature, predators, parasites, and control measures for cutworms are discussed. *Agrotis ypsilon* is reported attacking corn, cabbage, and tobacco.

Liu, C. L. 1941. Beginnings of a North China Pest Survey. Peking Natur. Hist. Bull. 15(3):225-234.
Plants attacked by *Agrotis ypsilon* include *Brassica chinensis*, buckwheat, eggplant, *Brassica campestris, Brassica rapa,* tea, cauliflower, barley, *Cucumis sativus,* and Kaoliang. Distribution in China is given. (229-230)

Luckmann, W. H., J. T. Shaw, D. W. Sherrod, and W. G. Ruesink. 1976. Developmental rate of the black cutworm. J. Econ. Entomol. 69(3):386-388.
"Developmental rates were calculated for all stages of *Agrotis ipsilon* (Hufnagel). The duration from oviposition to adult emergence is 643 centigrade-degree days at a threshold temperature of 10.4° C." (386)

Mamet, J. R. 1955. A revised food-plant catalogue of the insects of Mauritius. Bull. Dep. Agr. Maur. 90:1-95.
Agrotis ipsilon is recorded as a pest of potato in Mauritius. (83)

Mansour, M. H. 1977. Discrimination of different substrates for egg laying by *Agrotis ipsilon* (Hufn.) (Lepid-Noctuidae). Z. Angewandte Entomol. 83(2):169. (Title only.)

Mariani, M. 1939. Fauna Lepidopterorum Siciliae. Soc. Entomol. Ital. Mem. 17(2): 1-151.
Agrotis ypsilon Rott. was reported from Sicily between August and October. (143)

Meigen, J. W. 1827. Handbuch of Schmetterlingshebhaber. Verlag von La Ruelle & Dester:154.
The moth of *Noctua suffusa* (=*A. ipsilon*) is described in German. (Translated from German.)

Meyrick, E. 1895. A handbook of British Lepidoptera. Macmillan and Co., N. Y.
The adult and larva *Agrotis ypsilon* are described. Geographical distribution is given as Britain to the Shetlands, N. and E. Ireland, Europe, N. and W. C. Asia, and N. America. (91)

Millot, P. and M. Pralavoria. 1973. Tests for the control of polyphagous noctuids on artichoke crops in the Hyeres region. Phytoma. 25(248):23-25.
The black cutworm is reported as a pest of artichokes in the southeast of France. This cutworm is believed to spend the winter in Africa and then migrate to France. (23)

Moore, F. 1884. The Lepidoptera of Ceylon. Vol. 3. L. Reeve & Co., London. 361 pp.
The adult *Agrotis suffusa* is described and illustrated. (33, pl. 147)

Muller, F. P. 1949. Erdraupenschaden durch *Agrotis (Feltia) ypsilon* Rott. (Noct.). Nachrichtenblatt für den Deutschen Pflanzenschutzdienst, n.f. 3(1-2):10-13.
The life history and habits of *Agrotis ypsilon* in central Europe are discussed. A larval key is presented for the separation of *Agrotis ypsilon, A. exclamationis,* and *A. segetum.* Spiracles and skin textures of these three species are illustrated. The migration, geographical distribution, and host range from the world literature are discussed. Eighteen references to the black cutworm are included.

Nasr, E. A. and G. M. Moawad. 1972. Some ecological aspects concerning the black cutworm, *Agrotis ipsilon* (Hufn.). Bull. Soc. Entomol. Egypt 56:139-144.
The effects of temperature and relative humidity as well as soil moisture contents in relation to larval and pupal duration of the black cutworm were studied.

Neto, S. S., F. M. Lara, T. Igue, and C. A. B. Carvao. 1975. Flight activity of some Noctuidae determined by means of an automatic light trap. Ann. Soc. Entomol. Brasil 4(1):3-11.
"This work was carried out in order to determine the time of flight of the following noctuid pests: *Agrotis ipsilon* (Huf.), *Helico verpa zea* (Bod.), *Mocis latipes* (Guen.), *Pesudaletia adultera* (Schs.), and *Spodoptera frugiperda* (J. E. Smith) by means of an automatic light trap which allowed the parceled collecting of moths during the periods from 6:00 to 9:00 p.m., from 9:00 to 12:00 p.m., from 12:00 p.m. to 3:00 a.m., and from 3:00 to 6:00 a.m. in Piracicaba, State of Sao Paulo, during 4 months.
Through the results it was concluded that the species *Agrotis ipsilon* has a predominant periodicity of flight until midnight, decreasing right after. The other species fly mainly from 6:00 p.m. to 9:00 p.m. and this activity decreases from 9:00 p.m. to midnight, but during dawning there is practically no fly."

Newman, E. 1849. Illustrated natural history of British moths. W. Tweedie Publishers, London. 486 pp.
The moth and larva of the dark sword-grass (moth) *Agrotis suffusa* (=*ipsilon*) are described. The male and two forms of the female moth are illustrated. (318-319)

Nielsen, A. 1950. Noctuidefangst pa Honningdogg (Collecting noctuids on "honeydew.") Norsk. Entomol. Tidsskr. B. 8(1-3):126-128.
An unusual collecting technique was developed whereby noctuid moths were collected by hand at night from an elderberry hedge heavily infested with aphids. From 500 to 1,000 moths could be collected each night. A head lamp was used

to manipulate the moths into a killing jar. *Agrotis ypsilon* Rott. was one of the moths collected.

Odiyo, P. O. 1975. Seasonal distribution and migrations of *Agrotis ipsilon* (Hufnagel) (Lepidoptera, Noctuidae). Cent. Overseas Res., Trop. Pest Bul. 4:1-22.
The distribution of moths and larvae of *Agrotis ipsilon* (Hufnagel) has been plotted on monthly maps using data obtained from museum specimens, light-trap records, and the literature. This has provided new evidence of major seasonal redistributions of populations which appear to be dependent on temperature. The author has apparently failed to separate seasonal effects from the migrational aspects. The plotted distribution of *ipsilon* in North America is very incomplete. There is an excellent bibliography containing 39 references on seasonal distribution and migration.

Omino, T. and H. Tsuji. 1975. Experimental studies on behavioral differences among three noctuid species of larvae, *Agrotis ipsilon, Mamestra brassicae*, and *Spodoptera litura* in relation to the efficacy of a commercial bait. Jap. J. Entomol. & Zool. 19(1):11-16.
The order of efficacy of the poison bait granules (containing 1% trichlorfon) when placed on soil surface was *A. ipsilon>S. litura>M. brassicae*. Effectiveness may be related to the earliness of the developmental stage at which the larvae begin to enter the soil. The closest correlation was found between efficacy of the bait and that of readiness of the larvae leaving the leaves of the normal food plant.

Packard, A. S. 1877. The injurious insects of the west. S. E. Cassino, Salem.
Appearance and habits of cutworms are discussed. The larva of *Agrotis suffusa* is described. (717)

Packard, C. M. 1930. Overflow worm (*Agrotis ypsilon*). Rep. N. Cent. States Entomol. Conf. 9:21-22.
"OVERFLOW WORM (*Agrotis ypsilon*). C. M. Packard opened the discussion with the following statement: This insect destroyed several hundred acres of young corn in the Wabash River bottoms of southern Indiana last summer following late overflows. The poison bran bait usually recommended and found successful in controlling this insect under similar conditions in other states was entirely ineffective here, evidently due to the fact that the worms did not move about on the surface of the ground to any extent after the bait was spread. The lack of surface activity on the part of the worms was evidently due to the extremely dry, lumpy condition of the soil and low atmospheric humidity."

Paulian, R. and P. Viette. 1955. Essai d'un catalogue biologique des Lépidoptères heteroceres de Tananarive. Mem. Institut. Res. Scient. Madagascar. Ser. E. Entomol. 6:208.
In Madagascar *Agrotis ipsilon* is particularly destructive to tobacco, cotton, cultivated legumes, and potatoes.

Persson, B. 1974. Diel distribution of oviposition in *Agrotis ipsilon* (Hufn.), *Agrotis munda* (Walk.), and *Heliothis armigera* (Hbn.), (Lep. Noctuidae), in relation to temperature and moonlight. Experiments in an egg-laying recording apparatus in Queensland, Australia. Entomol. Scand. 5:196-208.
Oviposition was affected by a number of external factors. Temperature was the most important but the combined influence of temperature and moonlight had a great degree of influence on egg-laying. The study indicated moonlight has a negative influence on oviposition. Strong moonlight prevented females from laying eggs and also caused them to stop if they had already started.

Plenet, A. 1960. Parasites animaux des principales plantes cultivées à la Réunion. Rev. Agr. Réunion (N.S.) 60:167-181.
Agrotis ypsilon and *Prodenia litura* are reported as pests of potatoes on Reunion Island, just east of the Malagasy Republic. (174)

Poitout, S. 1969. Inbreeding among Noctuidae. Evidence of its importance in breedings under artificial conditions. Ann. Zool. Econ. Anim. 1(3):245-264.
"A stock of *Noctuidae* maintained in laboratory breeding (on natural or artificial medium (degenerates usually after two or three generations. This degeneration is not linked with the type of feeding or the environmental conditions. On the contrary, it is clearly related to the inbreeding conditions, which are mostly created unintentionally. By avoiding systematically strict inbreeding in our breedings on artificial medium, we could obtain 14 generations of *Helicoverpa armigera* (instead of 3), 10 generations of *Amathes c-nigrum* (instead of 5), 28 generations of *Spodoptera exigua* (instead of 2). This phenomenon has also been shown for *Mamestra oleracea* and *Peridroma saucia*. The stocks maintained in this way keep an average but constant fecundity and fertility." Only three generations of *Scotia* (=*Agrotis*) *ipsilon* could be reared before the culture degenerated due to inbreeding.

Reese, J. C. and S. D. Beck. 1976. Effects of allelochemics on the black cutworm, *Agrotis ipsilon*; effects of p-benzoquinone, hydroquinone, and duroquinone on larval growth, development, and utilization of food. Ann. Entomol. Soc. Amer. 69:59-67.
"The black cutworm, *Agrotis ipsilon* (Hufnagel), is a highly polyphagous species; therefore, the larvae are subjected to a wide variety of allelochemics. We have tested the hypothesis that some allelochemics may exert chronic effects on rate of growth, ingestion of food, utilization of food, and pupation. Growth and pupation were inhibited by p-benzoquinone. Duroquinone, a synthetic, inhibited survival, growth, and pupation."

Reese, J. C. and S. D. Beck. 1976. Effects of allelochemics on the black cutworm, *Agrotis ipsilon*; effects of catechol, L-dopa, dopamine, and chlorogenic acid on larval growth, development, and utilization of food. Ann. Entomol. Soc. Amer. 69:68-72.
"L-Dopa inhibited survival, growth, pupation, and pupal weight of the black cutworm, *Agrotis ipsilon* (Hufnagel). It inhibited growth by reducing assimilation of food and by reducing the efficiency of conversion of assimilated food into insect tissue, but had no effect on amounts ingested. Catechol did not inhibit survival or ingestion, but inhibited growth and pupation. Chlorogenic acid and dopamine had no apparent effect on survival, growth, pupation, or pupal weight."

Reese, J. C. and S. D. Beck. 1976. Effects of allelochemics on the black cutworm, *Agrotis ipsilon*; effects of resorcinol, phloroglucinol, and gallic acid on larval growth, development, and utilization of food. Ann. Entomol. Soc. Amer. 69:999-1003.
"Further evidence is presented in support of the hypothesis that allelochemics may exert chronic effects on rates of larval growth, ingestion, and utilization of food. Resorcinol inhibited ingestion and growth, but did not inhibit pupation or pupal weight of the black cutworm, *Agrotis ipsilon* (Hufnagel). Phloroglucinol inhibited survival, growth, and pupation. It inhibited growth by reducing the efficiency of conversion of assimilated food and the efficiency of conversion of ingested food. Gallic acid inhibited growth, survival, pupation, and assimilation of food."

Reese, J. C. and S. D. Beck. 1976. Effects of certain allelochemics on the growth and development of the black cutworm. Symp. Biol. Hung. 16:217-221.
"The black cutworm, *Agrotis ipsilon*, is a highly polyphagous species and therefore the larvae are subject to a wide variety of allelochemics (secondary plant substances having effects on other organisms). We have undertaken the experimental testing of the hypothesis that some of these allelochemics may have in addition to immediate effects on survival or feeding behavior, subtle chronic effects, even at low concentrations, on rate of growth, utilization of food and pupation. These subtle effects are best seen when the insect chronically ingests the chemical, as it would in a monoculture situation. We have found, for example, that certain chemicals which do not significantly inhibit 10-day survival, or have a slight effect on this parameter, may markedly inhibit pupation at concentrations of 10^{-4}M or lower. The concentrations at which we have found biological activity are well within the range at which many allelochemics occur in plants. We have been particularly interested in the chronic effects of substituted phenols and their oxidized forms (quinones)."

Rings, R. W. and J. P. Sleesman. 1975. Controlling the cutworm. Ohio Agri. Res. and Dev. Ctr., Ohio Rep. 60(3):38-39.
The black cutworm larva is described and illustrated. Typical feeding damage to lima bean, carrot, and potato are illustrated. Non-chemical methods include cultivation and mechanical barriers. Sevin, Spectracide, and Dylox are recommended for chemical control.

Rings, R. W., F. J. Arnold, and B. A. Johnson. 1975. Host range of the black cutworm on vegetables: a bibliography. Bull. Entomol. Soc. Amer. 21(4):229-234.
This publication documents the known host range of the black cutworm on vegetables from 19 countries. Thirty-seven vegetable host plants are listed and a bibliography showing the source of the reference is included.

Rings, R. W. and F. J. Arnold. 1976. Supplemental annotated bibliographies of the black cutworm, glassy cutworm, bronzed cutworm, bristly cutworm, and dingy cutworm. Supplement I. Ohio Agri. Res. and Dev. Ctr., Res. Circ. 212:1-44.
This is the first supplement to "A world-wide, annotated bibliography of the black cutworm, *Agrotis ipsilon* (Hufnagel)" and contains an additional 172 citations and annotations on the species.

Rings, R. W., G. J. Musick, A. J. Keaster, and W. H. Luckmann. 1976. Geographical distribution and economic importance of the black, glassy, and bronzed cutworms. Coop. Plant Pest Rep. 1(16):173-179.
The geographical distribution of three species of cutworms are shown on distribution maps of the United States and lower Canada. The economic importance of the species is discussed historically and currently.

Rings, R. W. and G. J. Musick. 1976. A pictorial field key to the armyworms and cutworms attacking corn in the North Central States. Ohio Agri. Res. and Dev. Ctr., Res. Circ. 221:1-36.
This publication contains two pictorial keys. The first key is for the identification of the different groups of soil pests such as slugs, wireworms, and caterpillars. There are 46 black and white illustrations showing the dorsal and lateral views of each caterpillar and other identification aids such as mandibles and skin texture. Suggestions are given on how to scout for cutworms and armyworms and how to preserve them for future studies.

Rings, R. W. 1977. An illustrated field key to common cutworm, armyworm, and looper moths in the North Central States. Ohio Agri. Res. and Dev. Ctr., Res. Circ. 227:1-60.

This publication is designed to assist pest management supervisors, entomologists, and county agents in identifying economically important species of moths. There are 34 black and white photographic illustrations of moths and a small silhouette beside each illustration indicates the approximate size of the species.

Rings, R. W. 1977. A pictorial field key to the armyworms and cutworms attacking vegetables in the North Central States. Ohio Agri. Res. and Dev. Ctr., Res. Circ. 231:1-35.
This publication contains two pictorial keys. The first key is for the identification of the different groups of soil pests such as slugs, wireworms, and caterpillars. There are 40 black and white illustrations showing the dorsal and lateral views of each caterpillar and other identification aids such as mandibles and skin texture. Suggestions are given on how to scout for cutworms and armyworms and how to preserve them for future studies.

Ripper, W. E. 1965. Cotton pests of the Sudan, their habits and control. Blackwell Sci. Publ., Oxford, England. 345 pp.
The economic importance, type of injury, plants attacked, life history, description and behavior, infestations, natural enemies, and control measures for cutworms are discussed. The more important species in the Sudan are *Agrotis ypsilon* (Rott.), *Agrotis segetum* (Schiff.), and *Euxoa spinifera* (Hb.).

Roark, R. C. 1950. A digest of information on toxaphene. U. S. Bur. Entomol. and Plant Quar., Ser. E. 802:1-85.
A 5% toxaphene dust gave good control of Agrotinae as did a suspension spray providing a comparable dosage. Toxaphene dusts of 3% and 5% strengths were about as effective as similar strengths of DDT. (36)

Salmon, J. T. and J. D. Bradley. 1956. Cape Lepidoptera. Records of the Dominion Museum 3(1):1-212.
Agrotis ypsilon is recorded from the Auckland Islands. (63)

Schaefer, B. and A. Breyer. 1942. List of the Lepidoptera of Catamarca and various observations. Rev. Soc. Entomol. Arg. 11(3):221-229.
"*Agrotis ypsilon* Rott. - Villa Cubas (Capital) 55 m (above sea level) July 1939." (227)

Schätz, V. W. 1953. *Agrotis ypsilon* Rott. als Schädling an Zuckerrüben (*Agrotis ypsilon* Rott. as a pest of sugar beets.) Nachrich tenbl. Bayer Entomol. 2:13-14.
Agrotis ypsilon Rott. is described as a pest of sugar beets in Germany. The seasonal history of the species is described. *Agrotis segetum* Schiffermüller is also a pest of sugar beets. (Translated from German.)

Schoenbohm, R. B. and F. T. Turpin. Effect of parasitism by *Meteorus leviventris* on corn foliage consumption and corn seedling cutting by the black cutworm. J. Econ. Entomol. 70(4):457-459
"Black cutworm larvae, *Agrotis ipsilon* (Hufnagel), when parasitized by *Meteorus leviventris* (Wesmael), consume 24.1% less corn foliage and cut 36.4% fewer corn seedlings than nonparasitized larvae. Reduced consumption and cutting were caused by cessation of host feeding activity following parasite emergence. Because parasitism by *M. leviventris* reduces potential black cutworm damage to seedling corn, treatment threshold precision can be increased by considering field rates of parasitism."

Sen, A. C. 1953. Bihar Dep. Agr., Annu. Prog. Rep., Sec. Entomol. 1-21.
Studies on life history, sex ratio, alternate host plants, and comparative efficacy of insecticides against *Agrotis ypsilon* are discussed. (6-7)

Sengupta, G. C. and B. K. Behura. 1957. Annotated list of crop pests in the State of Orissa. Mem. Entomol. Soc. India 5:1-44.
Agrotis ypsilon is listed as a minor pest of pulses and legumes in Orissa. (9)

Shaw, J. T., W. H. Brink, D. W. Sherrod, and W. H. Luckmann. 1975. Predicting infestations of wireworms, corn rootworms, and black cutworms in Illinois cornfields. 27th Ill. Custom Spray Oper. Train. Sch., Sum of Presentations:74-79.
Characteristics of 15 Illinois cornfields with infestations of *Agrotis ipsilon* larvae are discussed. Previous cutworm problems, surface debris and litter, soybeans planted the previous year, bottomland, and poor drainage were characteristics common to fields with black cutworm infestation. Feeding behavior and experiments with systemic insecticides are also discussed. (76-79)

Silveira-Guido, A. and J. C. Bruhn. 1965. Los enemigos del girasol en El Uruguay. Univ. Rep. Uruguay, Fac. de Agron. Bull No. 81:1-64.
The economic importance, geographical distribution, life cycle, and control of the black cutworm as a pest of sunflowers are discussed. The larva and adult are described and illustrated. *Euxoa ypsilon* (Rottemburg) is listed as a synonym. (20-22) (Translated from Spanish.)

South, R. 1948. The moths of the British Isles. Series I. 3rd. Ed. Frederick Warne & Co. Ltd., London. 312 pp.
The larva and adult *Agrotis ipsilon* are briefly described and its seasonal and geographical distribution are discussed. (209-210)

Speyer, A. 1875. *Agrotis ypsilon* Hufn. (*Suffusa* Wv.) Entomol. Zeitung. (Pub. by the Entomol. Soc. of Stettin) 131-175.
This is a comparative study of specimens of *ipsilon* from Massachusetts, New York, New Zealand, and Germany. Specimen size is indicated in mm. of wingspread. (135)

Spitzer, K. 1972. Seasonal adult activity of *Scotia ipsilon* Hfn. (Lepidoptera, Noctuidae) in Bohemia. Acta Entomol. Bohemoslovaca 69(6):395-400.
This contribution deals with the flight and reproductive seasonal activity of *Scotia ipsilon* Hfn. investigated in Bohemia (Czechoslovakia). The results indicate only one autochthonous generation per annum. The population of *S. ipsilon* in Bohemia is renewed every year by migrations from the South (probably Mediterranean). The migrants appear at the end of April, usually reaching a peak during June. Adults of one autochthonous generation emerge during August and September and disappear abruptly later in autumn. Their southward "return" migration is highly probable. The imaginal diapause (hibernation) seems not to be successful in Bohemia, according to the non-diapause condition of the ovary and fat reserves in autumn.

Staudinger, O. 1871. Catalog der Lepidopteren des Europaeischen faunengebiets. I. Macrolepidoptera. Dresden, Germany.
"1229. *Ypsilon*. Rott. Naturf. XI p. 141 (1776); ? *Ipsilon* Hufn. Berl. M. III P. 416. *Suffusa* (S.V. p. 80 n. Cat.) Hb. 134; Tr. V, 1. 152; God. 69, 1.2; Gn. 1 269; *Spinula* Esp. 63, 6.7. Eur. (Exc. reg. bor. And. et Sic.); As. oc; Sib. or." (88)

Sulcs, A. and J. Viidalepp. 1969. Verbreitung der Grosschmetterlinge (Macroledidoptera) in Balticum. Deut. Entomol. Z. 16:217-272.
Scotia ipsilon Hfn. was prevalent in Litauen, Germany. It was abundant in Lettland but did not occur in Estland. (218)

Swezey, O. H. 1937. Notes on potato insects in Hawaii. Proc. Haw. Entomol. Soc. 9(3):433-435.
"The greasy cutworm was present to some extent, feeding on weeds, also on the potato plants, and when the potatoes were being harvested, frequently tubers were found considerably eaten by them. As a demonstration of their eating capacity, a full-grown cutworm when placed with an uninjured tuber overnight ate a cavity as large as its own bulk. A few of the variegated cutworm were also found working similarly to the above." (433)

Swier, S. R., R. W. Rings, and G. J. Musick. 1976. Reproductive behavior of the black cutworm, *Agrotis ipsilon*. Ann. Entomol. Soc. Amer. 69(3):546-550.
"Calling ♀ black cutworms, *Agrotis ipsilon* (Hufnagel), showed visual orientation to live and dead moths. Traps baited with virgin females were most effective at a height of 1.5 meters. Females were most active in calling from midnight to 3 a.m. Most matings occurred about 6 hours after dark under a 10-hour scotophase. Females 4 days old were most attractive to males. Peak attractancy corresponded to age of peak ovarian development. The mean age at copulation for females was also 4 days. Oviposition by the black cutworm commenced on the 3rd day and peaked the 6th day after emergence at 24 ± 1.1° C and 70 ± 5% RH."

Swinhoe, C. 1900. Catalogue of Eastern and Australian Lepidoptera Heterocera in the collection of the Oxford University Museum. Part 2:8.
Noctua ypsilon, Phalaena idonea, Bombyx spinula, Noctua suffusa, and *Agrotis suffusa* are given as synonyms of *Agrotis ypsilon*.

Tawfik, M. F. S., M. T. Kira, and S. M. I. Metwally. 1974. A survey of the insect fauna of corn fields in Egypt. Bull. Soc. Entomol. Egypt 58:145-152.
Agrotis ipsilon was recorded from corn fields of Giza. (147)

Thongsinthusak, T. and R. I. Krieger. 1974. Inhibitory and inductive effect of piperonyl butoxide on dihydroisodrin hydroxylation *in vivo* and *in vitro* in black cutworm (*Agrotis ypsilon*) larvae. Life Sci. 14:2131-2141.
Biphasic inhibition and stimulation of microsomal oxidase activity in tissue homogenates *in vitro* and of dihydrosodrin hydroxylation *in vivo* in *Agrotis ypsilon* larvae have been produced by pretreating larvae with piperonyl butoxide.

Treat, A. E. Mites of moths and butterflies. Cornell Univ. Press. 332 pp.
A paratype of the parasitic mite, *Momorangia vallata* Southcott, has the distinction of being the only mite thus far recorded from a moth taken at sea. The host was one of nine specimens of *Agrotis ipsilon* taken during February 1970 20 miles off the west coast of New Zealand. (213) Undetermined species of *Tyrophagus* were found dead in a dry, unspread male of *Agrotis ipsilon* in New Jersey in 1956. (292)

Treitschke F. 1825. Die Schmetterlinge von Europa. 5(1):152.
Agrotis suffusa (=*A. ipsilon*) is briefly described in Latin. Twelve references in English, German, and French are cited as synonomical references. (152)

Viette, P. 1957. Lépidoptereères (excepte les tordeuses et les geometrides). Mem. Inst. Res. Sci. de Madagascar. Ser. E. Entomol. 8:1-226.
Agrotis ipsilon was reported from Reunion (an island 650 miles east of the Malagasy Republic near Africa). (185)

Viette, P. 1959. Lépidoptères de l' île Amsterdam (recoltes de Patrice Paulian, 1955-1956). Bull. Soc. Entomol. France 64(1-2):22-25.
Agrotis ipsilon (Hufnagel) is cosmopolitan in distribution and is a pest of tobacco, cotton, and lucerne. It is reported as a pest in Queensland, New Zealand, South Africa, Madagascar, and Holland. (25) (Translated from French.)

Walker, F. 1856. List of the specimens of Lepidopterous insects of the Britich Museum. 10:334.
A female *Agrotis bipars* (=*ypsilon*) from Venezuela is described.

Wallace, C. R. 1960. Report on an investigation of agricultural pests in St. Helena, 1957-1959. (London) Colon. Off. 54 pp.
Agrotis ipsilon is recorded as a pest of peas. (5)

Wallengren, H. D. J. 1860. Lepidopterologische mittheilungen. Wiener Entomol. Monatschrift 4:161-176.
Agrotis ipsilon is described as a "new species," *Agrotis frivola*, in Latin. The "new species" was from Montevideo, Uruguay. (169) (Translated from German.)

Warren, W. 1909. Rhyacia. *In* Seitz, A. Macrolepidoptera of the world 3:35-56.
The adult *Rhyacia ypsilon* is described. Also described are ab. *annexa* Steph. nec Tr., a small aberrant form, and ab. *pallida* Tutt, which has a white outer margin of the forewing. (37-38)

Weigel, C. A. and L. G. Baumhofer. 1948. Handbook on insect enemies of flowers and shrubs. U. S. Dep. Agr. Misc. Publ. 626:1-115.
Appearance, food plants, type of injury, and control methods are described briefly. *Amathes ypsilon* is one of the most common species. (2-3)

Wheeler, A. G., Jr. 1975. Insect associates of *Gingko biloba*. Entomol. News 86 (1&2):37-44.
"*Agrotis ipsilon* (Hufnagel) - Egg mass on leaf 28, July, Lancaster Co.; reared to maturity on gingko in laboratory, but in nature larvae probably would have dropped to ground to feed." (40)

Wolff, N. L. 1970. Revideret fortegnelse over Faerernes sommerfugle. (A revised list of the Lepidoptera known from the Faroe Islands.) Entomol. Meddelelser 38:3-14.
Agrotis ipsilon Hufnagel (=*Rhyacia ypsilon* Rott.) was reported as an immigrant to the Faroe Islands. These islands are a part of Denmark and are situated in the north Atlantic Ocean some 400 miles west of the coast of Denmark. (11) (Translated from Danish.)

Yano, K. 1964. Insects of Campbell Island. Lepidoptera: Tineidae, Elachistidae, Hyponomeutidae, Oecophoridae, Tortricidae, Pterophoridae, Noctuidae. Pacific Insects Monogr. 7:255-259.
Agrotis ipsilon (Hufnagel) was reported from four localities on Campbell Island; Beeman Camp, Beeman Station, Mt. Lyall, and Rennell. Campbell Island is about 650 miles south of New Zealand. The world distribution of *ipsilon* was recorded as Europe, Japan, Sachalin, Korea, Ryuku Isl., and North America. (259)

Yokoi, Shinji, Keigo Matsumoto, and Hideakira Tsuji. 1975. Laboratory evaluation of isoxathion and A10-64 as soil insecticides against the black cutworm and the cupreous chafer. Ann. Sankyo Res. Lab 27:78-84.
Two organophosphorous insecticides, isoxathion (E-48) and A10-64, were very effective against the larvae of the black cutworm and the cupreous chafer when they were incorporated into soil. Isoxathion has no fumigant effect, and the superior killing activity and moderate persistency seemed to be the main factors contributing to the effect of this insecticide in soil. A10-64, however, was highly active as a fumigant even when incorporated into soil, and this may influence the effect of this compound in soil.

Zaazou, M. H., H. S. M. Fahmy, A. A. M. Kamel, and A. H. El-Hemaesy. 1973. Annual movement and host plants of *Agrotis ipsilon* (Hufn.) in Egypt. Soc. Entomol. Egypt Bull. 57:175-180.
Infestation by *Agrotis ipsilon* began in Upper Egypt from September to November and then proceeded to Middle and Lower Egypt until May and June. Greatest damage to winter crops occurred in Upper Egypt. Many plants in their early stage can act as hosts for *A. ipsilon*, including Egyptian clover, alfalfa, lentil, wheat, fenugreek, chick pea, Egyptian lupin, chickling vetch, broad bean, peas, soybean, tomato, strawberry, cotton seedlings, and corn.

Zaazou, M. H., H. S. M. Fahmy, A. A. M. Kamel, and A. H. El-Hemaesy. 1973. Effect of food on the development of the greasy cutworm, *Agrotis ipsilon* (Hufn.). Soc. Entomol. Egypt Bull. 57:379-386.
The larval instar durations were correlated with the percentage of water content and crude protein in various food plants (berseem, chick pea, corn, and fenugreek). Pupal weight and adult longevity are also affected by larval food.

Zerny, H. 1935. Die Lepidoptererfauna des grossen atlas in Marokko and seiner randgebiete. Mem. Soc. Sci. Natur. Maroc. 42:1-21.
Moths of *Agrotis ypsilon* Rott. were collected at Oberes Reraia-Tal from May 25 to 28 and at Ijoukak from June 20 to 30 in French Morocco. (Translated from German.)

II. Supplement to Glassy Cutworm Bibliography

Caesar, L. 1927. Insects attacking vegetables. Ont. Dep. Agr. Bull. 325:1-63.
Types of injury, life history, and control of *Sidemia devastator* are given. (6-8)

Fitch, A. 1856. Indian corn. Affecting the stalks. 1st and 2nd Rep. Noxious, Beneficial and Other Insects, State of N.Y. 1-2:310-320.
The adult *Agrotis devastator* is described and illustrated (315: Plate 3, Fig. 2).
Life history, habits, and control of cutworms are discussed.

Grote, A. R. 1873. VII. A study of North American Noctuidae. Bull. Buffalo Soc. Nat. Sci. 1-95:128.
Phalaena devastator (Brace) and *Mamestra ordinaria* (Walker) are given as synonyms of *Hadena devastator*. Habitat, Atlantic District. (108)

Grote, A. R. 1875. Check list of the Noctuidae of America, North of Mexico. Beinecke & Zesch., Printers, Buffalo, N. Y. 28 pp.
The glassy cutworm is included in this list as *Hadena devastatrix* Grote. *Phalaena devastator* Brace, *Agrotis devant* Auct., *Mamestra ordinaria* Walker, *Mamestra unicolor* Walker, and *Mamestra contenta* Walker were considered synonyms. (8)

Lintner, J. A. 1888. Cutworms. N. Y. State Mus. Bull. 6:1-36.
Appearance, habits, natural history, favorable conditions, food plants, literature, predators and parasites, and control measures for cutworms in general are discussed. *Hadena devastatrix* is reported attacking corn and cabbage. The larva and adult are illustrated.

Rings, R. W. and F. J. Arnold. 1976. Supplemental annotated bibliographies of the black cutworm, glassy cutworm, bronzed cutworm, bristly cutworm, and dingy cutworm. Supplement I. Ohio Agri. Res. and Dev. Ctr., Res. Circ. 212:1-44.
This is the first supplement to the annotated bibliography of the glassy cutworm and contains 21 additional citations and annotations.

Rings, R. W., G. J. Musick, A. J. Keaster, and W. H. Luckmann. 1976. Geographical distribution and economic importance of the black, glassy, and bronzed cutworms. U. S. Dep. Agr., Coop. Plant Pest Rep. 1(16):173-179.
The geographical distribution of the glassy cutworm is mapped for the United States and lower Canada. Outbreaks of the species are also shown on the map.

Rings, R. W. and G. J. Musick. 1976. A pictorial field key to the armyworms and cutworms attacking corn in the North Central States. Ohio Agri. Res. and Dev. Ctr., Res. Circ. 221:1-36.
This publication contains two pictorial keys. The first key is for the identification of the different groups of soil pests such as slugs, wireworms, and caterpillars. There are 46 black and white illustrations showing the dorsal and lateral views of each caterpillar and other identification aids such as mandibles and skin texture. Suggestions are given on how to scout for cutworms and armyworms and how to preserve them for future studies.

Rings, R. W. 1977. An illustrated field key to common cutworm, armyworm, and looper moths in the North Central States. Ohio Agri. Res. and Dev. Ctr., Res. Circ. 227:1-60.

This publication is designed to assist pest management supervisors, entomologists, and county agents in identifying economically important species of moths. There are 34 black and white photographic illustrations of moths and a small silhouette beside each illustration indicates the approximate size of the species.

Rings, R. W. 1977. A pictorial field key to the armyworms and cutworms attacking vegetables in the North Central States. Ohio Agri. Res. and Dev. Ctr., Res. Circ. 231:1-35.
This publication contains two pictorial keys. The first key is for the identification of the different groups of soil pests such as slugs, wireworms, and caterpillars. There are 40 black and white illustrations showing the dorsal and lateral views of each caterpillar and other identification aids such as mandibles and skin texture. Suggestions are given on how to scout for cutworms and armyworms and how to preserve them for future studies.

Smith, P. W., J. G. Taylor, and J. W. Apple. 1959. A comparison of insect traps equipped with 6- and 15-watt blacklight lamps. J. Econ. Entomol. 52(6):1212-1214.
"In recent years entomologists have made increasing use of self-draining omnidirectional light traps (Taylor *et al.* 1956) equipped with 15-watt blacklight (BL) fluorescent lamps (1950 fluorens). Three years' experience with such a trap in Wisconsin has shown it was satisfactory for collecting many nocturnal species. In 1958 a study was conducted near Arlington, Wis., comparing this trap with a smaller self-draining omnidirectional unit equipped with a 6-watt blacklight lamp (570 fluorens)." (1212) The 6-watt trap, during eight nights of operation, trapped 167 glassy cutworm moths while the 15-watt BL trap caught 205 moths of this species. (1213)

Steck, W., E. W. Underhill, and M. D. Chisholm. 1977. Attraction and inhibition in moth species responding to sex-attractant lures containing Z-11-hexadecen-1-yl-acetate. J. Chem. Ecol. 3(5):603-612.
Sex attractants for several sympatric noctuid moths required Z-11-hexadecen-1-yl acetate and additional olefinic compounds (co-attractants) for effective, species-specific operation. In nearly all cases at least one of the co-attractant compounds for each species functioned as a strong inhibitor of one or more of the other species in the group. It was concluded that species specificity in sex attractants can be achieved through conspecific co-attractants which are at the same time transspecific inhibitors. The attractant-inhibitor relationships of four species including *C. devastor* of moths requiring Z11-16:Ac as a common attractant component is discussed.

Steck, W., E. W. Underhill, B. K. Bailey, and M. D. Chisholm. 1977. A sex attractant for male moths of the glassy cutworm *Crymodes devastator* (Brace), a mixture of Z-11-hexadecen-1-yl acetate, A-11-hexadecenal and Z-7 dodecen-1-yl acetate. Environ. Entomol. 6(2):270-273.
"Adult males of the glassy cutworm, *Crymodes devastator* (Brace), were attracted to traps baited with equal part mixtures of Z-11-hexadecen-1-yl acetate, Z-11-hexadecenal, and Z-7 dodecen-1-yl acetate. Other species were not attracted to this ternary sex attractant. Electroantennogram measurements revealed strong male antennal stimulations by each of the three components. Attractancy in the field was completely inhibited by the incorporation of small quantities of either Z-11-hexadecen-1-ol or Z-9-tetradecen-1-yl acetate in the chemical lures."

Treat, A. E. 1975. Mites of moths and butterflies. Cornell Univ. Press. 132 pp.
One female *Blattisocius keegani* Fox, a parasitic mite, was taken from the abdo-

men of a male *Crymodes devastator* at Tyringham, Mass., July 11, 1958. (94) The parasitic mite, *Blattisocius tarsalis* (Berlese) was found infesting *C. devastator* in August 1955 at Salt Lake City, Utah. (99)

Underhill, E. W., M. D. Chisholm, and W. Steck. 1977. Environ. Entomol. 6(2):333-7. Olefinic aldehydes as constituents of sex attractants for noctuid moths. "Alkenals have recently become known as components of the sex pheromones of a few lepidopterous species. A field survey of aldehydes and aldehyde-acetate mixtures as candidate lures for moths revealed general attractant activity in straight olefinic aldehydes of carbon number 12, 14, and 16. The numerous species captured by baited traps indicated that aldehydes may be as important in sex attractants as the better known acetates and alcohols. The main species captured were *Acronicta sperata* Grote, *Ceramica picta* (Harris), *Agrotis volubilis* Harvey, *Crymodes devastator* (Brace), *Eurois astricta* Morrison, *Euxoa acornis* Smith, *Euxoa obeliscoides* Guenée, *Faronta diffusa* (Walker), *Feltia ducens* (Walker), *Fishia derelicta* Hampson, *Lithomoia solidaginis* Hübner, *Nephelodes emmedonia* (Cramer), *Polia tacoma* Strecker, and *Schinia bina* Guenée."

III. Supplement to Bronzed Cutworm Bibliography

1974 Can. Insect Pest Rev. 52: 7, 11, 12.
"An outbreak of the bronzed cutworm occurred on the Tantramar Marshes near Nappan (Nova Scotia). (7) "Light to heavy infestations of the cutworm occurred in the Tantramar Marsh area. Injury to the grasses was not heavy. Many cutworm larvae died, most likely from disease in the fourth and fifth instars." (11) In Nova Scotia "bronze cutworm, *Nephelodes minians*, Guenée, on marsh grasses near Sackville averaged about 2 per sq. ft. on high dyke banks on May 21." (12)

Lintner, J. A. 1888. Cutworms. N. Y. State Mus. Bull. 6:1-36.
Appearance, habits, natural history, favorable conditions, food plants, literature, predators, parasites, and control measures for cutworms are discussed. *Nephelodes violans* (=*minians*) is recorded attacking corn.

Rings, R. W. and F. J. Arnold. 1976. Supplemental annotated bibliographies of the black cutworm, glassy cutworm, bronzed cutworm, bristly cutworm, and dingy cutworm. Supplement I. Ohio Agri. Res. and Dev. Ctr., Res. Circ. 212:1-44.
This is the first supplement to the annotated bibliography of the bronzed cutworm and contains 22 additional citations and annotations.

Rings, R. W., G. J. Musick, A. J. Keaster, and W. H. Luckmann. 1976. Geographical distribution and economic importance of the black, glassy, and bronzed cutworms. U. S. Dep. Agr., Coop. Plant Pest Rep. 1(16):173-179.
The geographical distribution of the bronzed cutworm is mapped for the United States and lower Canada. Outbreaks of the species are also shown on the map.

Rings, R. W. and G. J. Musick. 1976. A pictorial field key to the armyworms and cutworms attacking corn in the North Central States. Ohio Agri. Res. and Dev. Ctr., Res. Circ. 221:1-36.
This publication contains two pictorial keys. The first key is for the identification of the different groups of soil pests such as slugs, wireworms, and caterpillars. There are 46 black and white illustrations showing the dorsal and lateral views of each caterpillar and other identification aids such as mandibles and skin texture. Suggestions are given on how to scout for cutworms and armyworms and how to preserve them for future studies.

Rings, R. W. 1977. An illustrated field key to common cutworm, armyworm, and looper moths in the North Central States. Ohio Agri. Res. and Dev. Ctr., Res. Circ. 227:1-60.
This publication is designed to assist pest management supervisors, entomologists, and county agents in identifying economically important species of moths. There are 34 black and white photographic illustrations of moths and a small silhouette beside each illustration indicates the approximate size of the species.

Rings, R. W. 1977. A pictorial field key to the armyworms and cutworms attacking vegetables in the North Central States. Ohio Agri. Res. and Dev. Ctr., Res. Circ. 231:1-35.
This publication contains two pictorial keys. The first key is for the identification of the different groups of soil pests such as slugs, wireworms, and caterpillars. There are 40 black and white illustrations showing the dorsal and lateral views of each caterpillar and other identification aids such as mandibles and skin texture. Suggestions are given on how to scout for cutworms and armyworms and how to preserve them for future studies.

Smith, P. W., J. G. Taylor, and J. W. Apple. 1959. A comparison of insect traps equipped with 6-and 15-watt blacklight lamps. J. Econ. Entomol. 52(6):1212-1214.
"In recent years entomologists have made increasing use of self-draining omnidirectional light traps (Taylor *et al.*, 1956) equipped with 15-watt blacklight (BL) fluorescent lamps (1950 fluorens). Three years' experience with such a trap in Wisconsin has shown it was satisfactory for collecting many nocturnal species. In 1958 a study was conducted near Arlington, Wis., comparing this trap with a smaller self-draining omnidirectional unit equipped with a 6-watt blacklight lamp (570 fluorens)." (1212) The 6-watt trap, during 14 nights of operation, trapped 119 bronzed cutworm moths while the 15-watt BL trap caught 227 moths of this species. (1213)

Underhill, E. W., M. D. Chisholm, and W. Steck. 1977. Olefinic aldehydes as constituents of sex attractants for noctuid moths. Environ. Entomol. 6(2):333-7.
Alkenals have recently become known as components of the sex pheromones of a few lepidopterous species. A field survey of aldehydes and aldehyde-acetate mixtures as candidate lures for moths revealed general attractant activity in straight olefinic aldehydes of carbon number 12, 14, and 16. The numerous species captured by baited traps indicated that aldehydes may be as important in sex attractants as the better known acetates and alcohols. The main species captured were *Acronicta sperata* Grote, *Ceramica picta* (Harris), *Agrotis volubilis* Harvey, *Crymodes devastator* (Brace), *Eurois astricta* Morrison, *Euxoa acornis* Smith, *Euxoa obeliscoides* Guenée, *Faronta diffusa* (Walker), *Feltia ducens* (Walker), *Fishia derelicta* Hampson, *Lithomoia solidaginis* Hübner, *Nephelodes emmedonia* (Cramer), *Polia tacoma* Strecker, and *Schinia bina* Guenée.

Webster, F. M. 1893. Miscellaneous entomological papers. Bull. Ohio Agri. Exp. Sta. 51(4):138.
"For the major portion of the cutworms, I have much faith in laying down of poisoned grass or clover baits, but the larvae of *Hadena devastatrix* Brace and *H. stipata* Morris cannot be reached in this manner, as they do not come to the surface to feed. The first eats the plants directly off a short distance above the roots, while the last eats into the stem at about the same place, then tunnels its way upward, eating out the heart after the manner of the stalk borer, *Hydraecia nitela* Gn."

Zhdanov, V. M. 1953. Determination of viruses in man and animals. Acad. Med. Sci. USSR, Moscow, 348 pp.
Title only.

IV. Supplement to Bristly Cutworm Bibliography

Grote, A. R. 1875. Check list of the Noctuidae of America, North of Mexico. Beinecke & Zesch, Printers, Buffalo, N. Y. 28 pp.
The bristly cutworm is included in this list as *Mamestra renigera* Grote. *Celaena renigera* Stephens and *Celaena herbimacula* Guenée were considered synonyms. (8)

Lintner, J. A. 1888. Cutworms. N. Y. State Mus. Bull. 6:1-36.
Appearance, habits, natural history, favorable conditions, food plants, literature, predators, parasites, and control measures for cutworms are discussed. *Mamestra renigera* occurs in New York.

Milliron, H. E. 1958. Economic insect and allied pests of Delaware. Del. Agri. Exp. Sta. Bull. 321:1-87.
Lacinipolia renigera is recorded as a minor pest of alfalfa and clover. (9, 20)

Rings, R. W. and F. J. Arnold. 1976. Supplemental annotated bibliographies of the black cutworm, glassy cutworm, bronzed cutworm, bristly cutworm, and dingy cutworm. Ohio Agri. Res. and Dev. Ctr., Res. Circ. 212:1-44.
This is the first supplement to the annotated bibliography of the bristly cutworm and contains nine additional citations and annotations.

Rings, R. W. and G. J. Musick. 1976. A pictorial field key to the armyworms and cutworms attacking corn in the North Central States. Ohio Agri. Res. and Dev. Ctr., Res. Circ. 221:1-36.
This publication contains two pictorial keys. The first key is for the identification of the different groups of soil pests such as slugs, wireworms and caterpillars. There are 46 black and white illustrations showing the dorsal and lateral views of each caterpillar and other identification aids such as mandibles and skin texture. Suggestions are given on how to scout for cutworms and armyworms and how to preserve them for future studies.

Rings, R. W. 1977. An illustrated field key to common cutworm, armyworm, and looper moths in the North Central States. Ohio Agri. Res. and Dev. Ctr., Res. Circ. 227:1-60.
This publication is designed to assist pest management supervisors, entomologists, and county agents in identifying economically important species of moths. There are 34 black and white photographic illustrations of moths and a small silhouette beside each illustration indicates the approximate size of the species.

Rings, R. W. 1977. A pictorial field key to the armyworms and cutworms attacking vegetables in the North Central States. Ohio Agri. Res. and Dev. Ctr., Res. Circ. 231:1-35.
This publication contains two pictorial keys. The first key is for the identification of the different groups of soil pests such as slugs, wireworms, and caterpillars. There are 40 black and white illustrations showing the dorsal and lateral views of each caterpillar and other identification aids such as mandibles and skin texture. Suggestions are given on how to scout for cutworms and armyworms and how to preserve them for future studies.

Smith, P. A., J. G. Taylor, and J. W. Apple. 1959. A comparison of insect traps equipped with 6- and 15-watt blacklight lamps. J. Econ. Entomol. 52(6):1212-1214.

"In recent years entomologists have made increasing use of self-draining omnidirectional light traps (Taylor *et al.*, 1956) equipped with 15-watt blacklight (BL) fluorescent lamps (1950 fluorens). Three years' experience with such a trap in Wisconsin has shown it was satisfactory for collecting many nocturnal species. In 1958 a study was conducted near Arlington, Wis., comparing this trap with a smaller self-draining omnidirectional unit equipped with a 6-watt blacklight lamp (570 fluorens)." (1212) The 6-watt trap, during 16 nights of operations, caught 625 bristly cutworm moths while the 15-watt trap caught 849 moths of this species. (1213)

Treat, A. E. 1958. A five-year census of the moth ear mite in Tyringham, Massachusetts. Ecol. 39:629-634.
The moth ear mite, *Myrmonyssus phalaenodectes* Treat, infested four bristly cutworm moths encountered in Tyringham, Mass., from 1952 to 1957. (632-633)

V. Supplement to Dingy Cutworm Bibliography

In this bibliography *Feltia ducens* Walker and *Feltia subgothica* (Haworth) are considered as synonyms. *Feltia herilis* (Grote) and *Feltia jaculifera* (Guenée) are considered valid species.

Fitch, A. 1856. Indian corn. Affecting the stalks. 1st and 2nd Rep. Noxious, Beneficial and Other Insects, State of N. Y. 1-2:310-320.
Agrotis subgothica is the most common species of *Agrotis* in New York. The adult is described and illustrated (314; Plate 3, Fig. 1). Life history, habits, and control of cutworms are discussed.

Grote, A. R. 1873. VII. A study of North American Noctuidae. Bull. Buffalo Soc. Natur. Sci. 1:95-128.
A comparative description of *Agrotis herilis* and *A. subgothica* is given. (99)

Grote, A. R. 1875. Check list of the Noctuidae of America, North of Mexico. Beinecke & Zesch., Printers. Buffalo, N. Y. 28 pp.
The dingy cutworm is included in this list as *Agrotis subgothica* (Haw.). *Agrotis jaculifera* Guenée was considered a synonym. (5)

Grote, A. R. 1882. New checklist of North American moths. N. Y. Entomol. Club. 73 pp.
The dingy cutworm is included in this checklist as *Agrotis subgothica* Haworth. *Agrotis jaculifera* Guenée is listed as a synonym. (24)

Lintner, J. A. 1888. Cutworms. N. Y. State Mus. Bull. 6:1-36.
Appearance, habits, natural history, favorable conditions, food plants, literature, predators, parasites, and control measures for cutworms are discussed. *Agrotis subgothica* and *A. herilis* are recorded attacking corn.

McDunnough, J. H. 1928. A generic revision of North American agrotid moths. Can. Nat. Mus. Bull. 55:1-78.
The moth of *Feltia ducens* Walker is described. The male genetalia are described and illustrated. (35)

Milliron, H. E. 1958. Economic insect and allied pests of Delaware. Del. Agri. Exp. Sta. Bull. 321:1-87.
Feltia subgothica is recorded as a minor pest of clover, corn, crucifers, and potatoes, and a major pest of tomatoes in Delaware. (20,25,28,54,60)

Rings, R. W. and F. J. Arnold. 1976. Supplemental annotated bibliographies of the black cutworm, glassy cutworm, bronzed cutworm, bristly cutworm, and dingy cutworm. Supplement I. Ohio Agri. Res. and Dev. Ctr., Res. Circ. 212:1-44.
This is the first supplement to the annotated bibliography of the dingy cutworm and contains 16 additional citations and annotations.

Rings, R. W. and G. J. Musick. 1976. A pictorial field key to the armyworms and cutworms attacking corn in the North Central States. Ohio Agri. Res. and Dev. Ctr., Res. Circ. 221:1-36.
This publication contains two pictorial keys. The first key is for the identiciation of the different groups of soil pests such as slugs, wireworms and caterpillars. There are 46 black and white illustrations showing the dorsal and lateral views of each caterpillar and other identification aids such as mandibles and skin texture. Suggestions are given on how to scout for cutworms and armyworms and how to preserve them for future studies.

Rings, R. W. 1977. An illustrated field key to common cutworm, armyworm, and looper moths in the North Central States. Ohio Agri. Res. and Dev. Ctr., Res. Circ. 227:1-60.
This publication is designed to assist pest management supervisors, entomologists, and county agents in identifying economically important species of moths There are 34 black and white photographic illustrations of moths and a small silhouette beside each illustration indicates the approximate size of the speci

Rings, R. W. 1977. A pictorial field key to the armyworms and cutworms attacking vegetables in the North Central States. Ohio Agri. Res. and Dev. Ctr., Res. Circ. 231:1-35.
This publication contains two pictorial keys. The first key is for the identification of the different groups of soil pests such as slugs, wireworms, and caterpillars. There are 40 black and white illustrations showing the dorsal and lateral views of each caterpillar and other identification aids such as mandibles and skin texture. Suggestions are given on how to scout for cutworms and armyworms and how to preserve them for future studies.

Rings, R. W. and F. J. Arnold. 1977. Geographical distribution and economic importance of the clay-backed, dingy, dusky, and sandhill cutworms. U. S. Dept. Agr Coop. Plant Pest Rep. 2(48-52):881-886.
The economic importance of four species of cutworms attacking corn are discusse The occurrence of the four species in the United States and Lower Canada is illustrated.

Ripley, L. B. 1923. The external morphology and postembryology of noctuid larvae. Ill. Biol. Mon. 3:5-102.
The author reported that a dingy cutworm, *Feltia subgothica*, was accidentally left in water for 2 days but recovered after a few hours and resumed feeding. This provided the idea of using submergence in water as an index of the extent of the development of the subterranean habit in cutworms. (52)

Smith, P. W., J. G. Taylor, and J. W. Apple. 1959. A comparison of insect traps equipped with 6- and 15-watt blacklight lamps. J. Econ. Entomol. 52(6):1212-1214.
"In recent years entomologists have made increasing use of self-draining omnidirectional light traps (Taylor *et al.*, 1956) equipped with 15-watt blacklight (BL) fluorescent lamps (1950 fluorens). Three years' experience with such a trap in Wisconsin has shown it was satisfactory for collecting many nocturnal species. In 1958 a study was conducted near Arlington, Wis., comparing this trap with a smaller self-draining omnidirectional unit equipped with a 6-watt blacklight lamp (570 fluorens)." (1212) The 6-watt trap, during 16 nights of operation, trapped 1,408 dingy cutworm moths while the 15-watt BL trap caught 2,051 moths of this species. (1213)

Smith, R. C. 1943. Common insects of Kansas. Kan. State Board Agr. Rep. 62(255): 1-440.
The adult *Feltia subgothica* is briefly described and illustrated. The larvae occur in grassland and alfalfa. (243)

Treat, A. E. 1975. Mites of moths and butterflies. Cornell Univ. Press. 132 pp.
Dicrocheles phalaenodectes is reported as a parasite of *Feltia ducens*. (309)

Underhill, E. W., M. D. Chisholm, and W. Steck. 1977. Olefinic aldehydes as constituents of sex attractants for noctuid moths. Environ. Entomol. 6(2):333-7.

Alkenals have recently become known as components of the sex pheromones of a few lepidopterous species. A field survey of aldehydes and aldehyde-acetate mixtures as candidate lures for moths revealed general attractant activity in straight olefinic aldehydes of carbon number 12, 14, and 16. The numerous species captured by baited traps indicated that aldehydes may be as important in sex attractants as the better known acetates and alcohols. The main species captured were *Acronicta sperata* Grote, *Ceramica picta* (Harris), *Agrotis volubilis* Harvey, *Crymodes devastator* (Brace), *Eurois astricta* Morrison, *Euxoa acornis* Smith, *Euxoa obeliscoides* Guenée, *Faronta diffusa* (Walker), *Feltia ducens* (Walker), *Fishia derelicta* Hampson, *Lithomoia solidaginis* Hübner, *Nephelodes emmedonia* (Cramer), *Polia tacoma* Strecker, and *Schinia bina* Guenée.

VI. Supplement to Dark-sided Cutworm Bibliography

1974. Can. Insect Pest Rev. 52:7, 10, 18.
"On tobacco, generally, cutworm infestations were low. The most numerous species generally was the dark-sided cutworm followed by the black cutworm." (7) In Nova Scotia "dark-sided cutworm, black cutworm, and clover cutworm populations increased but variegated cutworm was down and almost non-existent." (10) In Ontario, "dark-sided cutworm, *Euxoa messoria* (Harr.), on tomato, potato, and sweet corn--population sporadic; damage replaced so delayed crop maturity." (18)

Cheng, H. H. 1972. Greenhouse studies on insecticidal control of dark-sided cutworm on tobacco seedlings. [*Euxoa messoria*] Tobacco (New York) 174(12):57-59. Title only.

Cheng, H. H. 1973. Laboratory comparison of stomach contact and fumigant action of chlorpyrifos against dark-sided cutworm (Lepidoptera-Noctuidae). Proc. Entomol. Soc. Ont. 104(73):22-25.
Results showed that the stomach action of chlorpyrifos was much quicker and significantly better the first day after treatment than the contact or fumigant action, and was the only treatment causing 100% mortality. There was no significant difference between contact and fumigant effects.

Cheng, H. H. 1977. Insect parasites of the dark-sided cutworm, *Euxoa messoria* (Lepidoptera:Noctuidae), in Ontario. Can. Entomol. 109:137-142.
In the study of insect parasites of the dark-sided cutworm, *Euxoa messoria* (Harris), fourth to seventh instar larvae were collected from a field at Delhi, Ont., and reared in the laboratory. A total of 701 insect parasites, including six species of Hymenoptera and four of Diptera, were reared from the 3,970 dark-sided cutworm larvae collected in 1973 and 1974. Thirteen species of insect parasites of *E. messoria* are listed. Ten of these species were reared in the present study from *E. messoria* in Ontario and all of them are primary and internal parasites. Of the 10, only two have previously been reported as parasites of *E. messoria*. Host-parasite relationship and the degree of parasitism are given for the 10 species reared in Ontario.

Grote, A. R. 1875. Check list of the Noctuidae of America, North of Mexico. Beinecke & Zesch., Printers, Buffalo, N. Y. 28 pp.
The dark-sided cutworm is included in this list as *Agrotis messoria* Harris. *Agrotis repentis* G. & R., *Agrotis cochrani* Riley, and *Agrotis lycarum* Grote were considered synonyms. (6)

Grote, A. R. 1875. XVII. Supplement to the list of North American Noctuidae. Bull. Buffalo Soc. Nat. Sci. 2:209-223.
"*messoria* Harris, Ins. Inj. Veg. Mass., 3rd Ed. p. 444; *Agr. cochrani* Riley, 1st Mo. Rep. 75; *Agr. repentis* G. & R., Trans. Am. Ent. Soc. 1,350, Pl. 7, fig. 58; *Agr. lycarum* Grote, List, p. 10 (Calif.) [Note.--This citation replaces the names cited in the list, p. 9, line 1, p. 10, lines 6, 7, and 13.]" (214)

Grote, A. R. 1882. New checklist of North American moths. N. Y. Entomol. Club. 73 pp.
The dark-sided cutworm is included in this check list as *Agrotis cochranii* Riley (25) and also as *Agrotis messoria* Harris. (24)

Hewitt, C. G. 1917. Report of the dominion entomologist for the year ending March 31, 1916. Can. Dep. Agr. 31, 35.
"In the eastern provinces of Ontario, Quebec, and the Maritime Provinces, considerable injury was effected. In the provinces of Ontario and Quebec, the striped cutworm, *Euxoa tessellata* Harr., and the dark-sided cutworm, *Euxoa messoria* Harr., were very abundant. Young beets, carrots, onions, etc. and flowering garden plants were destroyed. Along the north shore of the St. Lawrence river in Berthier County, Que., where large areas of tobacco are grown, extensive injury took place chiefly by *E. messoria*. In June I visited Lanoraie and Lavaltrie, Que., and observed farmers in these districts replacing large numbers of destroyed plants." (31) "In eastern Ontario the striped cutworm, *Euxoa tessellata* Harr., the dark-sided cutworm, *Euxoa messoria* Harr., and the red-backed cutworm, *Euxoa ochrogaster* Gn., were responsible for much loss in gardens where annual flowering plants had been set out." (35)

Hinks, C. F. and J. R. Byers. 1976. Biosystematics of the genus *Euxoa* (Lepidoptera: Noctuidae). V. Rearing procedures and life cycles of 36 species. Can. Entomol. 108:1345-1357.
"A rearing method, based upon an artificial diet, has proved successful in establishing laboratory colonies of 36 species of the genus *Euxoa*. The diet is described, along with methods for controlling disease, particularly by the use of antimicrobial agents. Many of the 36 species of *Euxoa* have not been reared before and their habits and life histories are little known. The data derived from their development under laboratory conditions and which can be related to seasonal distribution are recorded. Particular emphasis is given to the overwintering stage and to the occurrence of an aestivating stage." *E. messoria* was one of the 36 species studied.

Rings, R. W. and J. P. Sleesman. 1975. Controlling the cutworm. Ohio Agri. Res. and Dev. Ctr., Ohio Rep. 60(3):38-39.
This article describes and illustrates the appearance of the black, dark-sided, and variegated cutworms and their characteristic damage to vegetables. Control measures for cutworms attacking vegetables in the home garden are also discussed.

Rings, R. W. and G. J. Musick. 1976. A pictorial field key to the armyworms and cutworms attacking corn in the North Central States. Ohio Agri. Res. and Dev. Ctr., Res. Circ. 221:1-36.
This publication contains two pictorial keys. The first key is for the identification of the different groups of soil pests such as slugs, wireworms, and caterpillars. There are 46 black and white illustrations showing the dorsal and lateral views of each caterpillar, including the dark-sided cutworm, and other identification aids such as mandibles and skin texture. Suggestions are given on how to scout for cutworms and armyworms and how to preserve them for future studies.

Rings, R. W. 1977. An illustrated field key to common cutworm, armyworm, and looper moths in the North Central States. Ohio Agri. Res. and Dev. Ctr., Res. Circ. 227:1-60.
This publication is designed to assist pest management supervisors, entomologists and county agents in identifying economically important species of moths. There are 34 black and white photographic illustrations of moths, including the dark-sided cutworm moth, and a small silhouette beside each illustration indicates the approximate size of the species.

Rings, R. W. 1977. A pictorial field key to the armyworms and cutworms attacking vegetables in the North Central States. Ohio Agri. Res. and Dev. Ctr., Res. Circ. 231:1-35.
This publication contains two pictorial keys. The first key is for the identification of the different groups of soil pests such as slugs, wireworms, and caterpillars. There are 40 black and white illustrations showing the dorsal and lateral views of each caterpillar, including the dark-sided cutworm, and other identification aids such as mandibles and skin texture. Suggestions are given on how to scout for cutworms and armyworms and how to preserve them for future studies.

Seitz, A. 1919. Amerikanischen Faunengetbietes: Eulenartige Nachtfalter. Die Gross-Schmetterlinge der Erde. 7:43, 49
A brief synonomy is given of *Euxoa messoria* Harris: *spissa* Gn., *inextricata* Wkr., *indirecta* Wkr., *displiciens* Wkr., *expulsa* Wkr., *ordinata* Wkr., *reticens* Wkr., *cochrani* Riley, *repentis* Grt. A. R., *confracta* Morr., *friabilis* Grt. The form *territorialis* Sm. (*fulda* Sm.) is listed. A brief description of the moth and its geographical description are given. (43) (Translated from German.)

Struble, D. L. and G. E. Swailes. 1977. A sex attractant for males of the dark-sided cutworm, *Euxoa messoria* (Lepidoptera:Noctuidae). Can. Entomol. 109(7): 975-980.
"Field testing of a large number of synthetic compounds and several combinations of them revealed that male moths of the dark-sided cutworm, *Euxoa messoria* (Harris), were attracted to combinations of Z-7-hexadecen-1-yl acetate and Z-11-hexadecen-1-yl acetate. The most satisfactory attractants were combinations of these two compounds in ratios of 1:20 or 1:40. The presence of small amounts of the corresponding E-isomers did not interfere with the attractant. The diene, Z-7, Z-11-hexadecadien-1-yl acetate, in combination with Z-11-hexadecen-1-yl acetate also attracted the males, but there was no advantage in using the diene in place of Z-7-hexadecen-1-yl acetate."

VII. Supplement to Clay-backed Cutworm Bibliography

Grote, A. R. 1875. Check list of the Noctuidae of America, North of Mexico. Beinecke & Zesch., Printers, Buffalo, N. Y. 28 pp.
The clay-backed cutworm is included in this list as *Agrotis gladiaria* Morrison. (6)

Grote, A. R. 1882. New checklist of North American moths. N. Y. Entomol. Club. 73 pp.
The clay-backed cutworm is included in this checklist as *Agrotis gladiaria* Morrison. (25)

Rings, R. W. 1977. An illustrated field key to common cutworm, armyworm, and looper moths in the North Central States. Ohio Agri. Res. and Dev. Ctr., Res. Circ. 227:1-60.
This publication is designed to assist pest management supervisors, entomologists, and county agents in identifying economically important species of moths. There are 34 black and white photographic illustrations of moths, including the clay-backed cutworm moth, and a small silhouette beside each illustration indicates the approximate size of the species.

Rings, R. W. 1977. A pictorial field key to the armyworms and cutworms attacking vegetables in the North Central States. Ohio Agri. Res. and Dev. Ctr., Res. Circ. 231:1-35.
This publication contains two pictorial keys. The first key is for the identification of the different groups of soil pests such as slugs, wireworms, and caterpillars. There are 40 black and white illustrations showing the dorsal and lateral views of each caterpillar, including clay-backed cutworm, and other identification aids such as mandibles and skin texture. Suggestions are given on how to scout for cutworms and armyworms and how to preserve them for future studies.

Rings, R. W. and F. J. Arnold. 1977. Geographical distribution and economic importance of the clay-backed, dingy, dusky, and sandhill cutworms. U. S. Dep. Agr., Coop. Plant Pest Rep. 2(48-52):881-886.
The economic importance of four species of cutworms attacking corn are discussed. The occurrence of the four species in the United States and lower Canada is illustrated.

Smith, P. W., J. G. Taylor, and J. W. Apple. 1959. A comparison of insect traps equipped with 6- and 15-watt blacklight lamps. J. Econ. Entomol. 52(6): 1212-1214.
"In recent years entomologists have made increasing use of self-draining omnidirectional light traps (Taylor *et al.*, 1956) equipped with 15-watt blacklight (BL) fluorescent lamps (1950 fluorens). Three years' experience with such a trap in Wisconsin has shown it was satisfactory for collecting many nocturnal species. In 1958 a study was conducted near Arlington, Wis., comparing this trap with a smaller self-draining omnidirectional unit equipped with a 6-watt blacklight lamp (570 fluorens)." (1212) The 6-watt trap, during 14 nights of operation, caught 479 clay-backed cutworm moths while the 15-watt BL trap caught 906 moths of this species. (1213)

Sweet, E. H. 1915. The clay-back cutworm. Green's Fruit Grower 35(6):5.
Dust barriers, poison bait, and summer plowing of wheat fields are suggested as preventive measures for the clay-backed cutworm.

VIII. Supplement to Dusky Cutworm Bibliography

Grote, A. R. 1875. Check list of the Noctuidae of America, North of Mexico. Beinecke & Zesch, Printers, Buffalo, N. Y. 28 pp.
The dusky cutworm is included in this list as *Agrotis venerabilis* Walker. *Agrotis incallida* Walker was considered a synonym. (6)

Grote, A. R. 1882. New checklist of North American moths. N. Y. Entomol. Club. 73 pp.
The dusky cutworm is included in this checklist as *Agrotis venerabilis* Walker. *Agrotis incallida* Walker is listed as a synonym. (25)

Rings, R. W. 1977. An illustrated field key to common cutworm, armyworm, and looper moths in the North Central States. Ohio Agri. Res. and Dev. Ctr., Res. Circ. 227:1-60.
This publication is designed to assist pest management supervisors, entomologists, and county agents in identifying economically important species of moths. There are 34 black and white photographic illustrations of moths, including the dusky cutworm moth, and a small silhouette beside each illustration indicates the approximate size of the species.

Rings, R. W. and F. J. Arnold. 1977. Geographical distribution and economic importance of the clay-backed, dingy, dusky, and sandhill cutworms. U. S. Dep. Agr., Coop. Plant Pest Rep. 2(48-52):881-886.
The economic importance of four species of cutworms attacking corn are discussed. The occurrence of the four species in the United States and lower Canada is illustrated.

Smith, P. W., J. G. Taylor, and J. W. Apple. 1959. A comparison of insect traps equipped with 6- and 15-watt blacklight lamps. J. Econ. Entomol. 52(6):1212-1214.
"In recent years entomologists have made increasing use of self-draining omnidirectional light traps (Taylor *et al.*, 1956) equipped with 15-watt blacklight (BL) fluorescent lamps (1950 fluorens). Three years' experience with such a trap in Wisconsin has shown it was satisfactory for collecting many nocturnal species. In 1958 a study was conducted near Arlington, Wis., comparing this trap with a smaller self-draining omnidirectional unit equipped with a 6-watt blacklight lamp (570 fluorens)." (1212) The 6-watt trap, during eight nights of operation, trapped 60 dusky cutworm moths while 92 moths of this species were caught in the 15-watt BL trap. (1213)

IX. Supplement to Variegated Cutworm Bibliography

Anonymous. 1908. Principal injurious insects of 1908. U. S. Dep. Agr. Yearbook 1908:567-580.
The variegated cutworm (*Peridroma margaritosa* Haw.) was moderately abundant in portions of Virginia and Texas. (573)

Anonymous. 1949. Conference report on cotton insect research and control. U. S. Dep. Agr., Bur. Entomol. Plant Quar. 1,21,34.
"Tests have shown that a dust containing 10 percent of DDT, applied at the rate of 10 lb per acre or a spray containing 2 lb of toxaphene, is effective against the variegated cutworm *Peridroma margaritosa* (Haw.), and the granulate cutworm, *Feltia subterranea* (F.)" (21)

Bergold G. 1951. Fortschritte und Probleme auf dem Gebiete der Insektenviren. Ztschr. Angew. Entomol. 33:267-278.
Title only.

Bergold, G. 1953. Insect viruses. *In* Advances in virus research. Vol. 1. Smith and Lauffer eds. Academic Press N. Y. pp. 91-139.
Title only.

Berry, R. E. and H. H. Crowell. 1971. Chemical control of cutworms tested for vegetables. Ore. Veg. Dig. 20(2):3-4.
Laboratory and field studies with insecticidal baits and sprays were conducted against the variegated cutworm. Of the insecticidal baits evaluated, N-2596, Lannate, Dyfonate, Dylox, Biothion, and *B. thuringienses* showed the greatest promise against variegated cutworm larvae.

Bissell, T. L. 1938. Entomology. Ga. Agr. Exp. Sta. Rep. 50:65-71.
Title only.

1972. Can. Insect Pest Rev. 50:14,18,26.
In Nova Scotia "at Port Williams the variegated cutworm, *Peridroma saucia* (Hübner), severely damaged tobacco leaves." (14) "Moderate infestations of cutworms occurred in most areas of New Brunswick. In Nova Scotia, the variegated cutworm, *Peridroma saucia* (Hübner), appeared earlier than normal and damaging numbers were widely reported. At Boulardarie, *A. ipsilon* and *P. saucia* destroyed one-quarter of the plantings of cabbage and lettuce." (18) "Variegated cutworm outbreaks were at an all-time high in recorded history this season in Nova Scotia. For the first time in the province, they were found damaging fruit (apples). In one orchard at Port Williams, 10% of the fruit was injured." (26)

1973. Can Insect Pest Rev. 51:10,11,14,20,41.
In Nova Scotia "at Boularderie, C.B.I., the black and variegated cutworms continued to be very numerous on cabbage and lettuce; the damp climate in this area seems to favour them." (10) In Nova Scotia, "tobacco, in the Berwick area, was fairly heavily infested by the dark-sided cutworm, the variegated cutworm, and the black cutworm." (11) In Nova Scotia, variegated and black cutworms were less prevalent on vegetables. (14) In Quebec "the spotted cutworm, *Amathes c-nigrum* (L.), and the red-backed cutworm, *Euxoa ochrogaster* (Guen.), and the variegated cutworm, *Peridroma saucia* (Hubn.), are the three predominant species in the organic soil area. Onion is the main crop injured." (20) In Saskatchewan "variegated cutworm, *Peridroma saucia* (Hübner), on tomato and corn; larvae reported from tomatoes at Esterhazy and Melville and corn at Yorkton; total damage negligible." (41)

1974. Can. Insect Pest Rev. 52:1,7,14.
"The variegated cutworm, *Peridroma saucia* (Hbn.), was reported only once during 1974" in Newfoundland. (1) "Very few variegated cutworms were seen and no localized outbreaks were reported which is unusual" in Nova Scotia. (7). "Dark-sided cutworm, black cutworm, and clover cutworm populations increased but variegated cutworm was down and almost non-existent" in Nova Scotia. (18)

Carvalho, S., M. Fernando, S. Tarrago, and D. Link. 1971. Captura de noctuideos atraves de armadilha luminosa. I - Resultados Preliminares. Rev. Cent. Ciencias Rurais 1(3):15-22.
"This work was made to determine the noctuid occurrence at Santa Maria, RS, with a light trap. Forty-one species of noctuid adults were collected. This number corresponds to 38.2% of the moths trapped. The worms of nine noctuid species trapped are known to feed on the rice plant." Three moths of *Peridroma saucia* were trapped from March to July 1971 at Santa Maria.

Crowell, H. H. and R. E. Berry. 1971. Cutworms damage Oregon crops. Ore. Veg. Dig. 20(4):1-4.
Twenty-six materials and formulations of insecticides were evaluated for control of variegated cutworm on bushbeans. Results indicated that bait formulations were generally more effective than sprays. Lannate, Dyfonate, and N-2596 were promising replacements for DDT but lack of federal registrations limits their use to only a few crops at the present time.

Divimanov, M. and D. Vesselinov. 1968. Some pests of our ornamental plants. (Translation from Bulgarian). Rastitelna Zashtita 16(12):22-25.
Title only.

Dochkova, B. 1971. Injurious noctuids on sugar-beet in northern Bulgaria. Rast. Zasch. 19(12):11-13.
Nineteen species of noctuids are listed as infesting sugar-beets in the Pleven District of Bulgaria, including *Amathes c-nigrum* (L.), *Peridroma saucia* Hb., and *Agrotis ipsilon* (Hfn.).

Fernando, M., S. Tarrago, S. Carvalho, and D. Link. 1975. Survey of the family Noctuidae, with light traps, in Santa Maria, RS. Rev. Cent. Ciencias Rurais 5(2):125-130.
"The present work reports on a survey of the family Noctuidae in the region of Santa Maria, RS, with the "Luiz de Queiroz" light traps over a 2-year period with four collections per week. Species were catalogued on a monthly basis. Diversity index was calculated for the duration of the collections." *Peridroma saucia* was uncommon in these light trap collections.

Flint, W. P. 1920. The army-worm. Ill. State Nat. Hist. Surv., Entomol. Ser., Circ. 7:1-9.
"During nearly every armyworm outbreak there is also an abundance of the variegated cutworm. This pest will be found in the same situations as the armyworm and associated with it. It feeds readily upon clover and alfalfa, and often causes considerable injury to these plants which is attributed to the armyworm." (7)

Fowler, J. L. and E. L. Reeves. 1975. *In vivo* propagation of a microsporidan (*Nosema necatrix*) pathogenic to insects (*Trichoplusia ni, Heliothis zea*). J. Invert. Path. 25(3):349-353.
Title only.

Frick, K. E. and R. B. Hawkes. 1970. Additional insects that feed on tansyragwort, *Senecio ja cobaea*, an introduced weedy plant in western United States. Ann. Entomol. Soc. Amer. 63(4):1085-1090.
In a search for insects which might be used as biological control agents for weeds, the variegated cutworm was found to feed on the following plant genera, *Senecio, Inula, Cichorium, Cynara, Arctotis, Aster, Dahlia, Eupatorium, Conyza,* and *Erigeron*. (1088)

Fuchs, T. W., J. A. Harding, and T. Dupnik. 1972. Insecticidal control of variegated cutworm on cantaloupes. Texas Agri. Exp. Sta., Prog. Rep. 3135:1-4.
"Two experiments consisting of 16 treatments each were applied to cantaloupes infested with the variegated cutworms, *Peridroma saucia* (Hübner). Ground equipment was used to apply 4.3 or 12.9 gallons of formulation per acre. The statistical variability found among replicates made separation of treatment means difficult. Orthene, diazinon, Thuricide, Leptophos, and Lannate were numerically the most effective. No visible phytotoxicity was detected resulting from any of the treatments 2 days after application."

George, W. S. 1958. "Tomato moth" (*Peridroma saucia*) strikes at Orford. Trans. Suffolk Nat. Soc., Proc. of the year 1958. 11(1):90.
"Tomato Moth strikes at Orford. One of several fat caterpillars, each head first in a green tomato, proved on keeping to emerge as the Pearly Underwing Moth (*Peridroma saucia*, Hübn.). This moth is stated to feed on most low plants, hardly a tactful description in this case! W. S. George." (Great Britain).

Hampson, G. F. 1903. Catalogue of the Noctuidae in the collection of the British Museum. 4:534-537.
The larva and moth are described. Thirteen synonyms of *Lycophotia margaritosa* are given. The world distribution of the variegated cutworm is listed. (536-537)

Harper, J. D. and C. G. Thompson. 1973. Mortality in *Peridroma saucia* following single and combined challenge with DDT and nuclear polyhedrosis virus. Dep. Entomol. Ore. State Univ. Mimeo. pp. 307-315.
Title only.

Haworth, A. H. 1809. Lepidoptera Brittannica, Part II:213.
The pearly underwing, *Noctua margaritosa*, is described in Latin. In Great Britain its principal host is potato, but it occurs infrequently. (213) (Translated from Latin.)

Iren, Z. 1973. Investigations to determine the most important pests of viticulture in central Anatolia. Ankara Bölge Zirai Mücadeke Arastirma Enstitüsü. 40-41: 168-169.
Title only.

Leppla, N. C. and W. K. Turner. 1975. Carbon dioxide output and mating in adult cabbage looper moths *Trichoplusia ni* exposed to discrete light regimes. J. Insect Physiol. 21(6):1233-1236.
Title only.

Lhoste, J., S. Poitout, L. Penchi, and R. Bues. 1974. New technique for evaluation of insecticides on nocturnal moths (*Scotia ipsilon, Peridroma saucia*). Int. Symp. Fytofarm. Fytiat. 24(2):1205-1212.
Title only.

Link, D. and G. Knies. 1973. Aspects of the bionomics of cutworms that occur in Santa Maria R.S. Ann. Soc. Entomol. Brasil 2(1):66-73.
The major cutworm pest in Brazil is *Agrotis ipsilon*. Other important species are *Agrotis blanchardi* (Berg), *Agrotis malefida* (Guenée), and *Peridroma saucia* (Hübner). From 11% to 21% of cutworm species were parasitized by hymenopterous and dipterous parasites. (73)

McLaughlin, J. R., J. E. Brogdon, H. R. Agee, and E. R. Mitchell. 1975. Effect of trap color on captures of male cabbage loopers (*Trichoplusia ni*) and soybean loopers (*Pseudoplusia includens*) in double-cone pheromone traps. J. Ga. Entomol. Soc. 10(2):174-179.
Title only.

Millot, P. and M. Pralavario. 1973. Tests for the control of polyphagous noctuids on artichoke crops in the Hyeres region. Phytoma. 25(248):23-25.
Field tests were conducted in southeastern France to compare sprays of dieldrin, endosulfan, and methiocarb for control of noctuid larvae on artichokes. The target species were *Agrotis ipsilon* (Hfn.), *Peridroma saucia* Hb., and *Phlogophora meticulosa* (L).

Opheim, M. 1962. Catalogue of the Lepidoptera of Norway. Part II. Noctuoidea. Utgitt Av Norsk Entomologisk Forening, Oslo. 32 pp.
"204: *P. porphyrea* Schiff. (=*Rhyacia saucia* Hb.) Recorded from A. Ay:Vigeland [J. C. Hawkshaw, Entomologist 52 (1919)]. Later found at Ry: Vig Sept. 9, 1949, June 24 and 29, 1950 (A. Nielsen) and Ry: Time Sept. 13, 1950 (T. Arneson)" (26)

Riley, C. V. 1880. *Smilax* injured by cutworms. Amer. Entomol. 3:298.
"The moth is the Unarmed Rustic (*Agrotis saucia* Treit.), long known in this country as *A. inermis* Harr., it having lately been decided that the American and European insects are specifically identical. We have designated the larva as the variegated cut-worm, on account of its markings, and it will be found figured on Pl. 1, Figs. 1 and 2 of our 1st Rep. on the Insects of Missouri."

Rings, R. W. and J. P. Sleesman. 1975. Controlling the cutworm. Ohio Agri. Res. and Dev. Ctr., Ohio Rep. 60(3):38-39.
This article describes and illustrates the appearance of the black, dark-sided, and variegated cutworms and their characteristic damage to vegetables. Control measures for cutworms attacking vegetables in the home garden are also discussed.

Rings, R. W. and G. J. Musick. 1976. A pictorial field key to the armyworms and cutworms attacking corn in the North Central States. Ohio Agri. Res. and Dev. Ctr., Res. Circ. 221:1-36.
This publication contains two pictorial keys. The first key is for the identification of the different groups of soil pests such as slugs, wireworms, and caterpillars. There are 46 black and white illustrations showing the dorsal and lateral views of each caterpillar, including the variegated cutworm, and other identification aids such as mandibles and skin texture. Suggestions are given on how to scout for cutworms and armyworms and how to preserve them for future studies.

Rings, R. W. 1977. An illustrated field key to common cutworm, armyworm, and looper moths in the North Central States. Ohio Agri. Res. and Dev. Ctr., Res. Circ. 227:1-60.
This publication is designed to assist pest management supervisors, entomologists, and county agents in identifying economically important species of moths,

including the variegated cutworm moth. There are 34 black and white photographic illustrations of moths and a small silhouette beside each illustration indicates the approximate size of the species.

Rings, R. W. 1977. A pictorial field key to the armyworms and cutworms attacking vegetables in the North Central States. Ohio Agri. Res. and Dev. Ctr., Res. Circ. 231:1-35.
This publication contains two pictorial keys. The first key is for the identification of the different groups of soil pests such as slugs, wireworms, and caterpillars. There are 40 black and white illustrations showing the dorsal and lateral views of each caterpillar, including the variegated cutworm, and other identification aids such as mandibles and skin texture. Suggestions are given on how to scout for cutworms and armyworms and how to preserve them for future studies.

Rodebaugh, J. W. 1919. Hogs will clean up alfalfa worms. Iowa Farm. 2049:12.
"Fifty-seven Hampshire pigs were fenced in an alfalfa field heavily infested with variegated cutworm. The pigs devoured the cutworms voraciously and did not heed the feed call for 2 days." (12)

Schultz, V. G. M. 1923. Ein neues Duftorgan bei einer männlichen *Agrotis* Art. Mitt. Münchn. Entomol. Ges. 13:21-22.
A new organ of scent is described in *Peridroma saucia* (Hübner) and *Peridroma plecta*.

Sherman, F., Jr. 1914. Insect enemies of corn. N. C. Dep. Agr., Bull. 35:5-6, 17-19.
Variegated cutworm moths were reared from caterpillars attacking corn in North Carolina. The eggs, larvae, and adult as well as foliage damage are illustrated. (17)

Silveira-Guido, A. and J. C. Bruhn. 1965. Los insectos del girasol en el Uruguay. Univ. Rep. Uruguay, Fac. Agron. Bull. 81:1-64.
The economic importance, geographical distribution, life cycle, and control of the variegated cutworm as a pest of sunflowers are discussed. The larva and adult are described and illustrated. *Lycophotia margaritosa* Haw. and *Peridroma margaritosa* Haw. are listed as synonyms.

Specht, H. B. 1974. Cutworms (Lepidoptera: Noctuidae) of tobacco (*Nicotiana tabacum*: Solanaceae) in Nova Scotia. II. Fall rye and winter fallow effects on a field population. Can. Entomol. 106(1):73-77.
Young variegated cutworms appeared later in the spring than dark-sided cutworms and large larvae were not found causing damage to tobacco until mid-July after most dark-sided cutworms had ceased feeding. (77)

Speyer, A. 1875. *Agrotis saucia* H. Entomol. Zeitung (Stettin) Published by the Entomol. Soc. of Stettin. pp. 131-175.
Synonyms of *Agrotis saucia* Hbn. include *Agrotis inermis* Harris, variety *margaritosa* Haworth, (*Aequa* H.), and *Agrotis ambrosioides* Mor. The American *saucia* is considered synonymous with the European *saucia*. (134)

Steinhaus, E. A. 1949. Nomenclature and classification of insect viruses. Bacteriol. Revs. 13(4):203-223.
Title only.

Steinhaus, E. A. and C. G. Thompson. 1949. Granulosis disease in the buckeye caterpillar, *Junonia coenia* Hübner. Science 110:276-278.
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Steinhaus, E. A. 1953. Taxonomy of insect viruses. Ann. New York Acad. Sci. 56: 517-537.
Title only.

Sulcs, A. and J. Viidalepp. 1969. Verbreitung der Grosschmetterlinge (Macrolepidoptera) in Balticum. Deut. Entomol. Zeitschr. 16:217-272.
P. saucia Hb. was not found in Estland and its occurrence in Lettland was questionable. It was very rare in Litauen, Germany. (218)

Talbert, T. J. 1917. Control of some of the important garden and truck crop insects. Univ. Mo., Coll. Agr., Agr. Ext. Serv. Circ. 15:1-24.
Cutworms in general are discussed as pests of garden and truck crops in Missouri. The egg, egg mass, caterpillars, and moth of the variegated cutworm are illustrated. (24)

Tremblay, E. 1969. On the habitual feeding on fruit by the larvae of some species of Lepidoptera Noctuidae. Notiziario sulle Malattie delle Piante 80-81:3-7.
Title only.

Zhdanov, V. M. 1953. Determination of viruses in man and animals. Acad. Med. Sci. USSR, Moscow. 348 pp.
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